

Precision

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SHOOTING

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(Story on Page Three)

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SHOOTING GAMES

While bench rest rifle shooting is the most refined method of proving pure rifle and ammunition accuracy in competition, eliminating insofar as possible the human errors in shooting, International Shooting Union style of three position free rifle shooting is at the opposite extreme of requiring the highest degree of shooter skill, plus rifles and ammunition of the finest accuracy for this particular purpose.

ISU three position free rifle shooting with either .22 cal. rimfire rifles at 50 meters or center fire rifles at 300 meters, requires intelligent and constant training and practice to attain match winning skill. Casual once-a-week or less shooting practice simply cannot develop the muscular control and co-ordination necessary for creditable competitive performance in this style of shooting.

A vicious circle of a difficult game requiring specialized equipment, lack of ranges suitable for this type of shooting, and scarcity of competitive meetings, has held back expansion of ISU type shooting in the United States.

Protected firing points, enclosed on three sides, are a range necessity for satisfactory ISU type position shooting. The 300 meter center fire shooting poses the additional handicaps of space and pit operated targets. In most areas these more expensive ranges have seemed impractical for the small number of ISU type shooters to be served.

Competitive meetings are essential for the development of shooter excellence in any type of shooting. The relatively few participants in ISU type shooting, thinly spread over wide areas, plus the lack of suitable ranges for either practice or competitions, even of national scale, has held back competitive meetings to a very few, infrequent and widely separated ones in the past.

A slow but steady increase of interest in ISU type shooting is resulting in a few suitable ranges being built, either especially for or adaptable to this type of shooting, and probably more of this type of range will be built as the demand for their use increases. A range which is reported to be of ISU world championship shooting standards has been built by the Army at Fort Benning, Ga., and is now in use. The 1958 International Rifle and Pistol Team final tryouts will be fired on this range and the selected team squads will train there before leaving for competitions in Europe and climaxing in the ISU World Championship competitions in Russia. Another large scale range of similar standards at Tulsa, Oklahoma, is presently in the planning board stage and it now

seems assured for use in 1959 or 1960. This range is a project of industrialist-sportsman John Zink of Tulsa, with the National Rifle Association and the U. S. Army actively cooperating. When completed, this range is designed for large scale competitions and is centrally located to serve a large number of interested competitors, both civilian and military.

Our military services appear to be the logical source of successful candidates for U. S. Rifle and Pistol Teams to engage in world-wide competition, since the military shooters may be provided the opportunity for the constant and intensive training which is required for excellence of performance in this type of shooting. This may be subsidized shooting, but it is within ISU eligibility requirements, and to this writer it seems logical, necessary and desirable if the United States is to compete on a world-wide scale with some reasonable prospect of success. Both the Army and the Marine Corps seem to be providing sizable squads of prospective International Team candidates with this needed intensive training, and in addition the military services appear to be making a real effort to develop new ISU type shooters for future competition. This gives promise of stronger U. S. Teams for world shooting competition in 1958 and the near future than for many recent years.

Few individual civilian shooters can devote either the time or the money necessary for the constant intensive training and practice necessary to develop performance equal to world competition standards. Very few, if any, individuals of financial means or commercial firms appear to show interest in providing such assistance as may be possible within ISU requirements for eligibility to civilian shooters with demonstrated talent in ISU style shooting with either rifle or pistol. No few individuals and members of commercial firms have been quite critical of the performance of recent past U. S. International Shooting Teams. These people have been very free with advice as to what should be done to improve the situation but, so far as this writer has ever heard, have done little if anything other than to criticize and advise. They evidently expect "George" to do the job and provide the money, but "George" is a very badly overworked guy these days with demands on every side for his limited spare cash.

In spite of publicized evidence to the contrary, there are numbers of people in these United States for whom the challenge of the difficult holds allure. From the ranks of these normal people, those with an interest in shooting as a hobby and competitive sport will supply the recruits for ISU type shooting. As this writer gazes into the crystal ball he sees a steadily increasing number doing just that.

While the foregoing has dwelt with ISU rifle shooting, the ISU pistol courses are not a bit less demanding in constant intensive training and practice to develop excellence in performance and present as great a challenge as do the rifle courses. Weapons are specialized, with those for the slow fire free pistol being the most refined specimens of the hand-gun makers art. Ranges with protected firing points are a necessity and the target set-up for the rapid fire on silhouette targets is different and more complicated than for any other pistol course. In spite of handicaps the ISU pistol courses are steadily, if slowly, attracting new converts.

No free pistols and no rifles designed for ISU type shooting are commercially produced in the U. S. Free pistols must be imported and free rifles must either be imported or custom made by individual riflemiths in the U. S. U. S. .22 cal. auto-loading pistols are adaptable to ISU rapid fire courses and at least one U. S. manufacturer produces a pistol especially designed for this type of shooting. There is no mass market for these specialized weapons at present and, so far as this writer knows, the U. S. arms manufacturers have shown little if any evidence of being interested in helping promote such a market.

In past years our National Rifle Association has borne the brunt of the criticism of the weak showing of rifle and pistol teams in international competitions for too many past years. There is no doubt that some of that criticism has been deserved. However, the job was too big for the NRA, or any other shooting organization, without some cooperating assistance. There now seems to be a generous measure of that co-operative assistance from our military services. If there is such cooperative assistance from our arms manufacturers or shooting accessory dealer organizations, this writer does not know about it, but would be very happy to be assured that there is. Individuals who want to see U. S. shooting teams back in the forefront of world competition can assist by making contributions, even small ones, to the NRA fund for meeting the necessary expenses of our International Shooting Teams.

PHT

NOT NECESSARILY SO

For as long as I can remember I have been reading in shooting books and periodicals that resting a rifle directly on or against a solid object would cause the weapon to shoot away from the point of contact—that is—the shot would go wide in the direction opposite to the point of contact of the weapon with the solid rest. I have in the past accepted that theory as shooting gospel and have avoided using solid available rests in field shooting.

Of late, as a result of my own bench rest shooting experiences and of observing hunter riflemen checking their sporting rifles in a manner that I had considered entirely wrong, I had begun to suspect that this theory of resting on solid objects causing shots to go wild was not necessarily true.

Early this season I did some experimenting along this line with two .30 cal. rifles at 100 yards. Rifles were a Krag rifle with issue barrel cut to 24" in a sporterized issue Krag carbine stock, shimmed at forearm tip to give upward pressure against barrel, and a recent 03A3 'unserviceable' Springfield with handguard removed and forearm cut to sporter length, barrel free-floating—both rifles shot with full charge sporting handloads.

First shot both rifles from normal bench rest with forearm and toe of butt resting on sand-bags. Then shot each rifle to one target from the following positions: Butt on shoulder, forearm resting in hand supported on a solid rest; forearm rested directly on a solid wooden block, bare barrel forward of forearm rested directly on the wooden block, successively with forearm pressed directly against the right and left side of a solid post. The composite group indicated no variation of point of impact from the different resting methods, or from the point

of impact from normal bench rest with two point resting on sand-bags. The composite resting group was no more enlarged from the normal bench rest group than might be reasonably expected from the less steady shooting positions.

This was rather convincing to me but I did not consider this one brief test entirely conclusive. I mentioned the results of my experiment to several other riflemen, including Colonel Townsend Whelen, suggesting further experiment along this line.

I have recently heard from Colonel Whelen that he has conducted some carefully controlled and recorded tests along this line, with normal sporting rifles and full charge sporting ammunition, and that he has found no more variation in point of impact from varying resting positions on solid objects than I did. He tells me that he intends to prepare a report of his tests, with illustrations, and submit it to GUNS magazine.

I have recently done some further check shooting at 200 yards; this time with the same Krag with same loads, a .222 cal. varmint weight rifle and a heavier .219 Donaldson rifle. Shooting was from normal bench rest with sand-bags, prone with sling, resting forearm on cement block on ground (a single sheet of paper between block and forearm to prevent scratching forearm finish), and with forearm pressed firmly against opposite sides of a tree. As at 100 yards, there was no appreciable change in point of impact which could be attributed to the various methods of supporting the rifles, even when shooting prone with sling.

As a result of these experiments, my own conclusion is simply that the hunter-rifleman may very well take advantage of any natural rest available to steady his hold and aim, as time and conditions permit, with the assurance that his resting method, alone, will not tend to cause his shots to go wild. Resting the rifle, by any method, will not overcome wide shots caused by non-uniform aiming or flinching.

The present conclusions of this writer should not be accepted as entirely correct—the testing has been insufficient to warrant that. It is suggested that other riflemen conduct their own experiments with their own rifles and loads to find if point of impact does or does not vary materially as a result of different resting methods.

P. H. T.

RIFLE BOWLING

The RIFLE BOWLING HANDICAP ASSOCIATION (4040-40 St. No., St. Petersburg, Florida) is conducting a program of postal team matches on a nation wide scale, which was due to get under way the first week of June.

For individuals or clubs that may wish to try rifle-bowling, special targets for shooting (or playing) this hybrid game over standard outdoor prone small-bore rifle courses, and rules for shooting and scoring, are available from the Florida headquarters.

We have been supplied with a bulletin of the trial rifle-bowling match fired during the Mid-Winter Tournament at St. Petersburg in March. Seventy-one fired the 20 shots at 50 meters with any sights course, plus two shots per 10-shot string for the bowling scoring. Normal gun-score and bowling score are both listed for comparison. The point that does show up is that **consecutive** X's do give a real premium to the rifle-bowling scoring. This is indicated by

the comparison of the top ranking 14 (by rifle-bowling scoring) below.

| | |
|-----------------|------------------|
| D. B. Puckel | 200-19 . . . 569 |
| C. L. Barnes | 200-18 . . . 568 |
| Winnifred Carr | 200-17 . . . 559 |
| F. P. Archer | 200-18 . . . 558 |
| W. H. Womack | 200-17 . . . 558 |
| V. Wright | 199-18 . . . 545 |
| C. Morris | 200-17 . . . 538 |
| J. B. Miller | 200-16 . . . 528 |
| L. W. Samsel | 200-16 . . . 526 |
| P. J. Vigoletti | 200-16 . . . 526 |
| J. C. Herr | 200-17 . . . 525 |
| H. Hollister | 199-17 . . . 525 |
| F. Morgan | 199-16 . . . 517 |
| H. Clark | 200-16 . . . 516 |

Wright's 199-18 was 27th ranking score by conventional gun score. Hollister's 199-17 would have been no better than 28th gun score, but a 199-17 by Willis ranked 21st by rifle-bowling scoring.

By NRA classification; high gun scores for Master, Expert and Sharpshooter classes were also high in class by rifle-bowling scoring. In Marksman class, gun scores of 198-15 and 198-14 ranked above 199-12 and 199-11 by rifle-bowling tally.

This writer, personally, does not get wildly enthusiastic about any gimmick scoring or handicapping. The one point he does see in favor of rifle-bowling scoring is that it does require consistent center hitting in order to make high bowling scores. The only way others may properly find out if they do or do not like the Rifle-Bowling game is to try it themselves, and we do recommend that they do just that.

We would be glad to hear the reaction of people who have tried this rifle-bowling game more extensively than we have, especially in club groups, both large and small.

PHT

REV. O. T. MCGINN
By Kent Bellah

Photo courtesy GUNS MAGAZINE

Father O. T. McGinn, "The Shooting Priest of Texas" is an exhibition shooter and hunter of big game who could teach experts some of the finer points of gun handling. His shooting career started three score and ten years ago, and he is still as active as many men in their 30's. The good Father says, "Shooting is good medicine for young and old. It clears the mind and is a 'fountain of youth.'"

His favorite game is moose, elk, bear, deer, caribou and wolves. He has made four long trips to the sub-arctic regions, and three to Europe. Some of his shooting feats seem impossible, especially for a man 80 years old. Rifles are his hunting arms, but some of his handgunning would make the handgunners take notice. Such as holding a single action Colt upside down to split bullets on a razor blade, causing the split slugs to hit targets on either side. The Irish marksman gets his shots off so fast he doesn't seem to aim.

"Why I couldn't hit anything if I didn't," he says. "Shooting is a matter of coordination between sight, judgment and muscular reaction. When you are in sight, you squeeze the trigger." The Catholic priest puts a very high value on fast sight alignment and trigger squeeze.

The rifle in the picture is his "Golden Gun," a gift from E. A. Hatton of San Antonio, for his golden anniversary as a priest. It was custom made by Royal Arms Co., El Cajon, Calif., with a 22/250 barrel. The ebony stock was soaked in oil a year before being carved by Beall. The magazine section, trigger and trigger guard are gold. Fr. McGinn can put 5 shots in one ragged hole at 100 yards.

LETTERS

Dear Mr. Teachout:

In the current issue of Precision Shooting (May 1958), John S. Kuntz has the type of letter that just irritates the beezeezus out of me. Half-facts serve no purpose except to start a train of letters from people like me.

1) Colt revolvers never set or kept too many target records and S&W made the first target records way back when.

2) For ordinary self defense, the Colt revolver is quite adequate, but for FAST shooting under pressure, double action of course, no revolver made has ever equaled the reliability of the S&W. I can jam a Colt anytime in fast double action shooting. The return spring for the trigger is just not fast enough.

3) Regarding the S&W and alibis on the firing line, if Kuntz had ever seen the things done to S&W mainsprings that I have seen, he would appreciate how well designed they are. After seeing some of the things done in the name of "smoothing an action," I am always surprised that the things even fire a cartridge. Left alone and correctly fitted and finished, the S&W will prove to give more consistent hammer fall than the Colt.

4) Enough said.

Sincerely,
Mason Williams
New York

Dear Phil:

Referring to the letter of Mr. John S. Kuntz in the May issue, and particularly that part stating that Smith & Wesson revolvers cause 90% of the alibis in center fire matches. I am not prepared to confirm or otherwise this statement, but in fairness to a top notch gun I would advance a possible explanation, assuming the statement is correct.

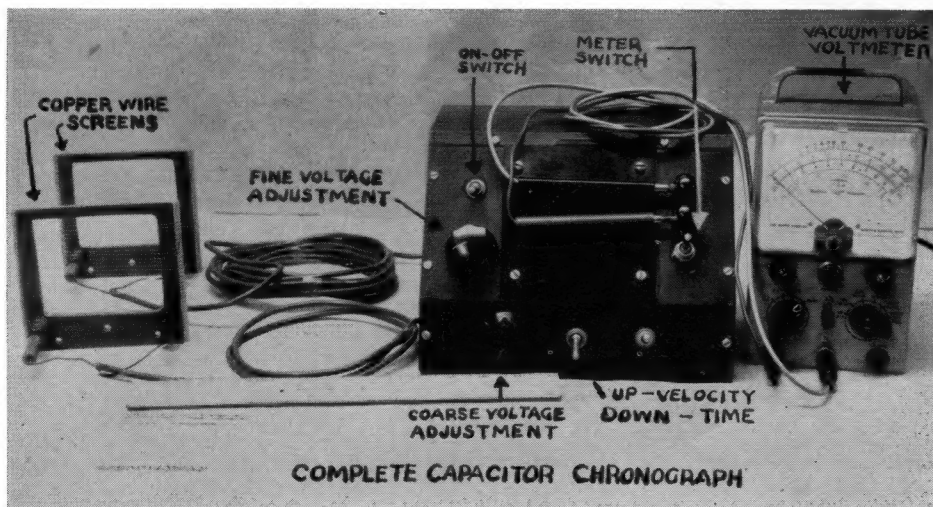
Unlike the Colt revolver, the S&W has a small screw in the front of the grip, low down, the purpose of which is to put the tension on the hammer spring **after** the spring is in place. This screw is supposed to be driven in all the way, to put full tension on the spring. However, the temptation is always there to back off this spring somewhat to get a lighter pull. Back it off too far and you get misfires, as I well know by sad experience. I am afraid this is what occurs in the alibis Mr. Kuntz talks about, or at least most of them, the fault being in the shooter, not the gun.

As to adding a shim to the spring, I have done that too, using an inch or two of clock spring to add stiffness to the hammer spring. But since I shoot a revolver double-action, the hammer does not have the length of travel which occurs in single action and thus does not hit so hard, so I have had to help it a bit sometimes when using hard primers, or in the case of an old gun in which the spring was getting a bit tired. I have shot Smiths for twenty years, but never found one which would fail to fire any primer when used single action.

Yours very truly,
William E. Peterson
Connecticut

Dear Phil:

I wish to comment on two articles in the May issue. While I am not a serious pistol shooter on either game or targets, I like to play around with them. "Them" being a SA Colt 38 Special, a S&W Special, two S&W Russians, a Bisley 44 Special, and a SA 45 Colt. My first mould for the 38 was a Thompson (Continued on Page Nineteen)



WHY NOT BUILD YOUR OWN CHRONOGRAPH?

by
DANIEL L. WHITEHEAD

UNIVERSAL NEED FOR A CHRONOGRAPH

Sooner or later practically everyone who owns or is interested in firearms or actively participates in the shooting game has the need to measure bullet velocity. It may be that he is interested in how fast a new wildcat case pushes a particular bullet, or simply what velocity he is getting with his pet handload in a standard rifle. Of interest to the serious long range target shooter is the effect of wind on various bullet weights and shapes. By using a chronograph to measure muzzle velocity and the time of flight over a given range a very accurate picture of the wind drift characteristics of a particular bullet can be determined since this data gives the time lag and wind drift is quite closely proportional to the time lag.

The interest in chronographs is not new. Since the very early days of the muzzle loaders experimenters have used various schemes for determining bullet velocities. These range from simple trajectory and penetration tests, through a chain of development to the modern high speed electronic counter-chronograph that not only gives a visual indication of the velocity, but also neatly prints to five or more digit accuracy the velocity of each shot as it is fired.

EARLY TYPES OF CHRONOGRAPHS

One of the early types of chronographs that has been used in a number of laboratories with considerable success is the Le Boulenger recorder. The theory of the Le Boulenger recorder is quite simple, however, the mechanical details are somewhat involved restricting the instrument primarily to laboratory use. It measures velocity by having the bullet break a wire near the muzzle of the rifle which in turn marks and releases a free falling rod. When the bullet breaks a second wire at a measured distance from the first wire, a second solenoid is tripped to again mark the falling rod. By carefully measuring the distance between marks on the rod, the time required for the bullet to move from the first wire to the second wire can be calculated which in turn gives the velocity of the bullet.

The famous Dr. Mann measured bullet velocities by using two spinning disks on a common shaft. By firing a bullet through the moving disks, the

hole through the second disk would be displaced from that through the first disk. For a known separation of the disks and a known constant rotational velocity, the velocity of the bullet could be calculated in terms of the displacement of the second hole with respect to the hole through the first disk. Modern counter-chronographs make use of an accurate oscillator to provide a time base and have a digital element that is started and stopped by some sensing element which in turn is activated by the passage of a bullet. These sensing elements can be wire screens, photo cells, microphones, capacitor plates or other devices that start and stop the electronic counter as the bullet passes measured distances from the muzzle of the gun. Most of these chronographs have a number of serious faults as far as the average gun enthusiast is concerned. They are in general quite complicated, require considerable skill to operate and, probably most important, are quite expensive. With these factors in mind a deliberate attempt has been made to design a simple, reliable and inexpensive chronograph that will measure velocities with sufficient accuracy to meet the needs of the typical experimenter. As a result of this investigation a capacitor type chronograph has been built with a total cost for parts of less than \$50.00. It is simple to use, weighs only a few pounds and has an accuracy of better than 1/2%.

DESIGN OF CAPACITOR TYPE CHRONOGRAPH

During and following World War II a tremendous amount of research and development was done on analog computers. These ingenious marvels of perfection have been made to solve advanced problems in all fields of science. For example, a typical one would be the complete simulation of the flight of a guided missile giving performance data on proposed designs without actually constructing the missile. Two fundamental elements that make such computers possible are precision resistors and capacitors. The widespread use of these components has had the effect of making them readily available at a very reasonable cost. Precision non-inductive resistors of the type needed for a chronograph can be purchased for less than \$2.00 each. Low loss, highly stable capacitors of the proper size sell for about \$15.00.

A capacitor chronograph is based on the characteristic of a resistor and capacitor in series to take charge or to discharge at a controllable rate that admits of precise calculation. For example, if

a battery with a voltage of E_0 is connected through a switch, S , to a resistor, R , and a capacitor, C , as shown in Fig. 1, the voltage, E_c , across the capacitor at any instant can be found from the basic differential equation for this circuit:

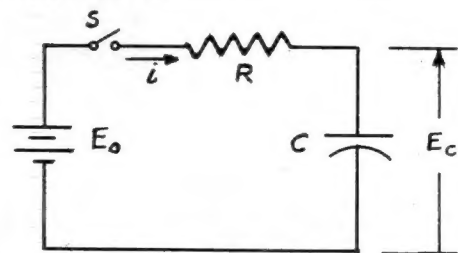


Fig. 1

Basic circuit for capacitor chronograph of the charging type.

$$E_0 = Ri + \frac{1}{C} \int i dt \text{ volts (1)}$$

$$\text{From which } i = \frac{E_0}{R} (1 - E \frac{t}{RC}) \text{ amps (2)}$$

$$\text{then } E_c = \frac{1}{C} \int i dt = E_0 (1 - E \frac{t}{RC}) \text{ volts (3)}$$

Thus, for given values of E_0 , R and C it is possible to calculate t in terms of E_c which is the measured voltage across the capacitor. If the switch S were closed by a bullet passing one point and then opened when the bullet passes a second point at a measured distance from the first point, then the voltage on the capacitor could be measured which would permit the calculation of t from equation (3) which would be the time of travel of the bullet between the two points thereby determining its velocity. This system has a number of serious faults. First, the battery voltage must remain precisely constant during the capacitor charging period and secondly, its internal resistance must remain constant and be known precisely. Although this circuit has been used in chronographs, it does not have the inherent high accuracy that is desired.

These faults can be eliminated by using a capacitance-resistance discharge circuit rather than a charging circuit. Let it be assumed that a capacitor is charged to some arbitrary voltage in any convenient fashion. Then let the capacitor be discharged through a resistor as shown in Fig. 2.

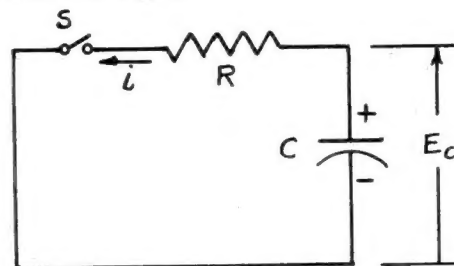


Fig. 2

Basic circuit for capacitor chronograph of the discharging type.

The equations that describe the flow of current after the switch S is closed is given by

$$Ri + \frac{1}{C} \int i dt = 0 \text{ volts (4)}$$

$$\text{or } i = \frac{E_0}{R} E \frac{t}{RC} \text{ amps (5)}$$

Then the remaining voltage across the capacitor at any instant is given by

$$E_c = \frac{1}{C} \int i dt = E_0 e^{-\frac{t}{RC}} \text{ volts (6)}$$

Equation (6) can be rewritten as

$$\frac{E_c}{E_0} = e^{-\frac{t}{RC}} \quad (7)$$

In this fashion t is given in terms of the ratio of the applied voltage to the remaining voltage on the capacitor. The discharge can be started by the bullet passing one point and stopped when it passes the second point. Using the ratio of the initial voltage to the remaining voltage on the capacitor has a very important advantage. This comes about due to the fact that meters capable of measuring absolute voltages to accuracies better than 1% are quite expensive. However, meters with comparative accuracy of 0.1% are relatively inexpensive. Furthermore, this permits the capacitor to be charged to any convenient voltage since the ratio of the initial to the remaining voltage is used to determine t which in turn gives velocity.

VOLTAGE MEASURING INSTRUMENTS

The capacitor chronograph is dependent upon accurately measuring capacitor voltage ratios. A d.c. voltmeter with a low input impedance is not satisfactory for these measurements. The low impedance would cause the capacitor to discharge through the meter and the meter pointer would drift down too fast to obtain an accurate reading. Input impedances of not less than ten megohms are desirable. A number of vacuum-tube-voltmeters (VTM) are on the market that meet these requirements quite nicely. In kit form they can be bought for about \$25.00. Completely assembled and factory tested they sell for about \$45.00. These are general purpose meters and are invaluable for TV and radio servicing and can be obtained from any of the radio parts supply houses. Those equipped with 1.5/5/15/50/150 volt ranges are most convenient for chronograph work.

When using the chronograph the initial voltage is adjusted to one volt. After the shot is fired the remaining

voltage on the capacitor is read directly without changing scales. Since one volt was chosen as the initial voltage $E_c/E_0 = E_c/1 = E_c$ thus giving the desired ratio reading directly. Adjusting the initial voltage to one volt is arbitrary of course, and any other value can be used if desired.

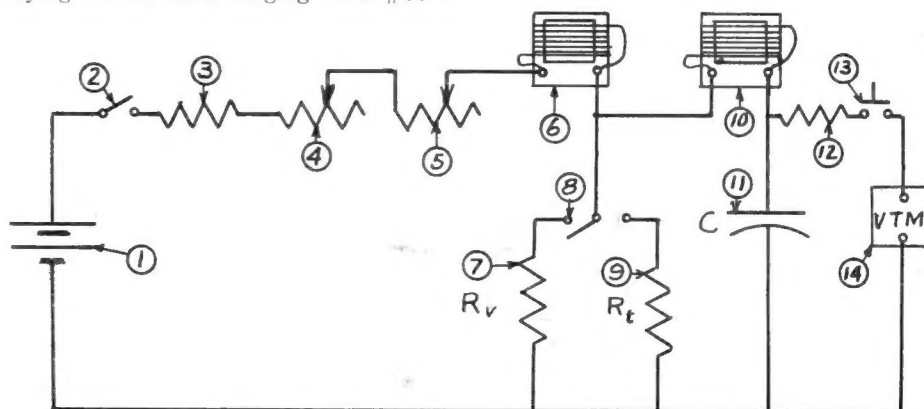
TRIPPING CIRCUITS

There are numerous methods for starting and stopping the capacitor discharge as the bullet passes the tripping stations. Photocells, mercury relays, microphones, capacitor plates and many others have been used. In the interest of keeping the circuitry simple and at low cost, copper wire screens have been designed that do the job quite adequately. Fig. 3 shows the details of a screen made up by threading #36 copper magnet wire over a Micarta supporting frame. The #36 wire was selected after trying various sizes ranging from #30 to

Each spool contains over a mile of wire and about ten ft. is required for each screen. The screens are broken by the bullet and are replaced after each shot. This is not as convenient as photocells, but is a lot less expensive. It takes about three minutes to wind the screens, fire the shot and read and record the velocity. This set-up working on the circuit opening principle permits the velocity reading to be held on the capacitor until it is convenient to read it. On one occasion, it was found that an accurate reading had been retained on the chronograph from one week end to the next. The screens are accurately spaced 10 ft. apart for velocities from 2000 f.p.s. to 5000 f.p.s. and are spaced 5 ft. for velocities under 2000 f.p.s.

DETAILED CIRCUIT OF THE CAPACITOR CHRONOGRAPH

Since both wire screens are broken



Detailed wiring diagram for capacitor chronograph of the discharge type. 1. 45 volt "B" battery (12 v. auto battery can be used if desired, in which case resistor 3 should be omitted.) 2. On-off toggle switch. 3. 400 ohm 2-watt carbon resistor. 4. 1500 ohm 2-watt potentiometer for coarse voltage adjustment. 5. 200 ohm 2-watt potentiometer for fine voltage adjustment. 6. Micarta frame strung with #36 copper magnet wire. 7. 400 ohm precision non-inductive 2-watt resistor. 8. Single-pole-double throw toggle switch (S. P. D. T.) 9. 30,000 ohm precision non-inductive resistor 2-watt. 10. Same as 6. 11. 10 microfarad stabelex "D" type S capacitor Industrial Condenser Corp., Chicago, 18, III. 12. 4-10 megohm 1/2 watt carbon resistor in series to make up 40 megohms. 13. Single-pole spring return toggle switch. 14. Vacuum Tube Voltmeter Heathkit, Eico, Sylvania or equivalent. (10 megohm or more input impedance.)

#40 magnet wire. The #36 wire is 0.005 inches in diameter, has a resistance of 0.423 ohms per ft. and is about as small as can be handled easily. It can be bought in 1/2 lb. spools for about \$1.50.

by the bullet, it is necessary to have the basic circuit of Fig. 2 arranged so that breaking the circuit will first disconnect the battery and start the discharge and then breaking the second screen must stop the discharge. A circuit that will do these functions is shown in Fig. 4.

MEASUREMENT OF TIME OF FLIGHT

It will be noticed that two precision resistors are shown, either of which can be connected to the capacitor through the single-pole-double-throw (s.p.d.t.) toggle switch. The 400 ohm value is used when measuring velocities and the 30,000 ohm value when measuring time of flight. The reason for two values of R is that calculations for optimum performance for the short screen spacings used for measuring velocity show that the circuit time constant ($R \times C$) should be approximately 0.004000. For measuring time of flight over distances up to 1000 yds. where one screen is near the muzzle and the other screen at the distance to which the time of flight is to be measured, the time constant should be approximately 0.3000. If it were desirable to do so, additional screens and RC circuits can be parallel with the first to measure velocities and time of flight at any number of points along the path of the bullet.

In attempting to buy exactly 400 ohm resistors and 10 mfd. capacitors it will be found that exact values can be (Continued on Page Six)

Make from 1/8" Micarta Sheet

Saw cuts on 3/32" Centers

Drill for binding posts and mounting screws

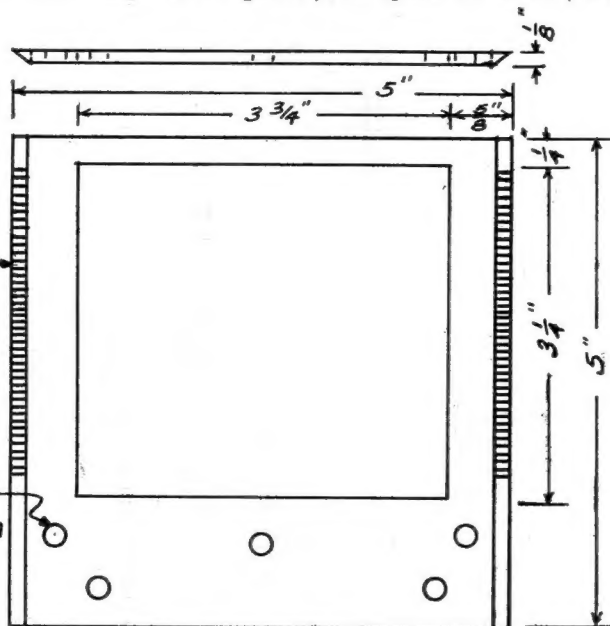


FIG. 3

Details of insulated screen frame.

Why Not Build Your Own Chronograph

(Continued from Page Five)

bought only with considerable difficulty. It is not actually important that these exact values be obtained. The important thing is that the exact values be **known**. Most supply houses have bridges available that can measure these items at the time of purchase. These known values of R and C are then used in equation (7) to prepare a graph or table giving velocity for all values of E_c/E_o . The velocity is given by $10/t$ for the 10 ft. spacing and $5/t$ for the 5 ft. screen spacing.

EXAMPLE OF TABLE CALCULATION

For my chronograph the product of

$R \times C$ is 0.0037989. This includes lead resistance and screen resistance of the second screen since it is in the discharge circuit in series with the precision resistor. The VTM used in measuring E_c/E_o can be read to three significant figures consequently, a table was calculated for E_c/E_o ranging from 0.268 to 0.590 in steps of 0.001. This would cover the velocity range from 1000 f.p.s. to 5000 f.p.s. For example, substituting 0.268 in eq. 7

$$0.268 = E \frac{-t}{0.0037989} = E \frac{-10}{0.0037989} \text{ for } 10' \text{ spacing}$$

$$= E \frac{-5}{0.0037989} \text{ for } 5' \text{ spacing}$$

By the use of natural logarithms or from Mathematical tables giving values of

$E-x$ we have

$$\frac{10}{0.0037989} V = 1317 \text{ OR } V = 2000 \text{ F.P.S.}$$

AND

$$\frac{5}{0.0037989} V = 1317 \text{ OR } V = 1000 \text{ F.P.S.}$$

Thus, a table can be made up as follows:

| E_c/E_o | V f.p.s. for 5' spacing | V f.p.s. for 10' spacing |
|-----------|----------------------------|-----------------------------|
| 0.268 | 1000 | 2000 |
| 0.269 | 1003 | 2006 |
| 0.270 | 1006 | 2012 |
| --- | --- | --- |
| --- | --- | --- |
| 0.588 | 2476 | 4952 |
| 0.589 | 2488 | 4976 |
| 0.590 | 2500 | 5000 |

These values can be used either in tabular form or plotted as a curve as shown in Fig. 5. Using the longer time constant of $RC=0.3000$ a plot for determining time of flight is given in Fig. 6.

CALIBRATING THE CHRONOGRAPH

After the chronograph is built it can be checked for over all accuracy by comparing the results obtained with published data such as that prepared by the NRA staff and the H. P. White laboratories. In comparing results the same test conditions should be duplicated as closely as possible. Same muzzle distances should be maintained and same temperature conditions as nearly as possible. With otherwise identical conditions the muzzle velocity may vary as much as 200 f.p.s. in the high velocity calibers from a cold winter day to a hot summer day. One of the easiest checks I have found is by the use of a 22 RF target rifle with match grade ammunition. Having a relatively low velocity, the 22 rim fire is not affected by temperature as much as the high pressure high velocity center fire cases. Excellent checks against published data can be had. On a recent check using Remington match ammunition, the maximum deviation about the average of 10 shots was only 6 f.p.s. At the same time some low cost standard velocity ammunition was fired with a deviation of 65 f.p.s. about the average which explained why the cheap ammunition was not performing properly on the range.

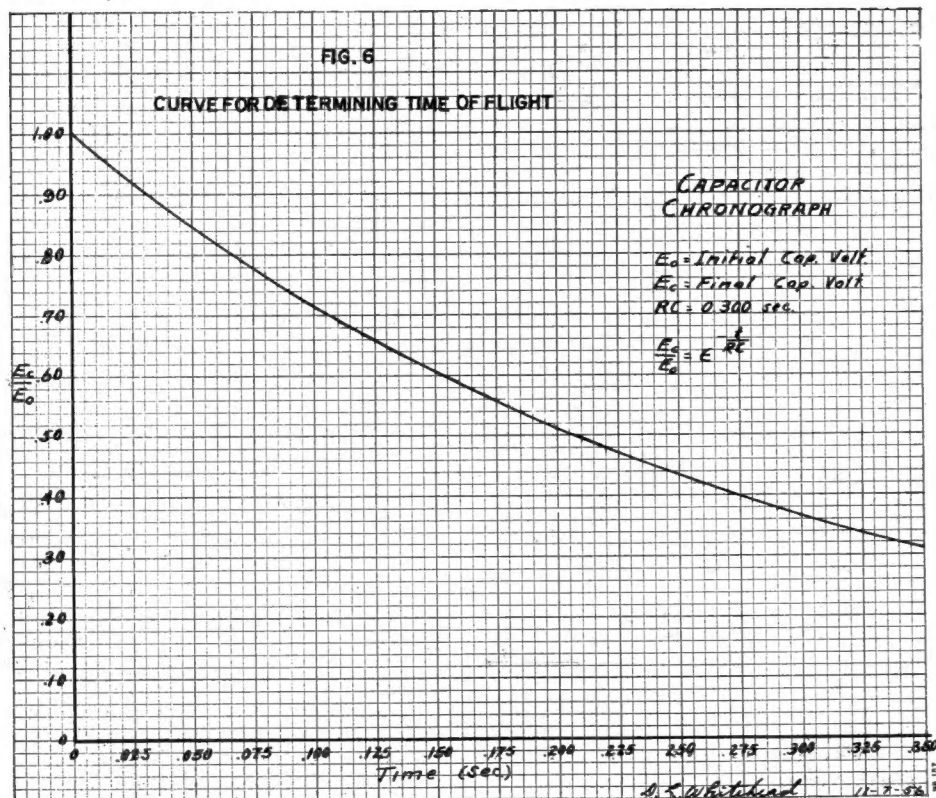
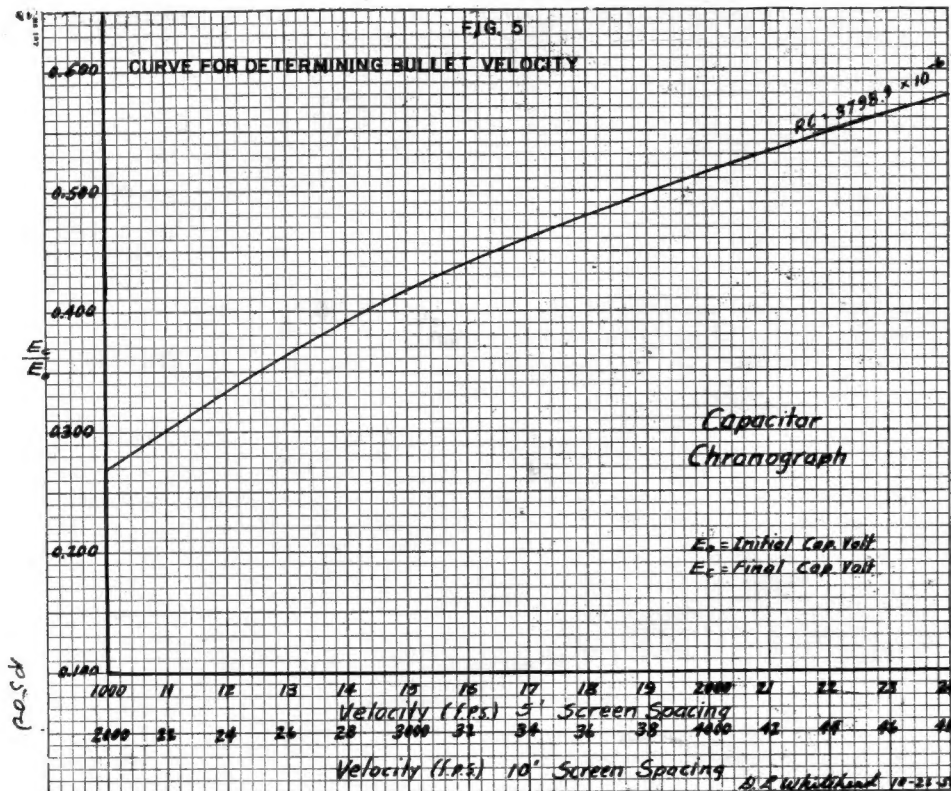
Having an accurate and easy to use chronograph available answers a lot of ballistic questions. The effects of twist rate, barrel length, determination of ballistic coefficients for different bullet shapes and the performance of new case designs are but a few of the many questions that can be answered.

COLT PYTHON .357

By Kent Bellah

The Python .357 is Colt's finest target grade center fire gun. Colt's say it's the "finest revolver made" and many shooters agree. Digesting hot .357 fodder as well as the full range of .38 Special loads with fine accuracy, it's quite suitable for everything from plinking to match shooting, or hunting varmints or small game, and animals in the big deer and black bear class. It's a refined, heavy version of the old record setting Colt Officers Model Match, a long time favorite with many paper punchers. Weighing 44 ounces, the extra 5 ounces are mostly in the heavy 6" barrel. This reduces recoil and muzzle jump and aids holding and the trigger let off.

An integral ventilated rib is a feature some shooters have custom installed on other guns. Colt's discovered there





Kent Bellah Photo

were plenty of shooters willing to buy a premium grade gun at a premium price when they brought out the Python in 1955 with considerable hand polishing and fitting. Colt's Royal Blue is an attractive and durable finish in highly polished steel, well buffed even in the hard to get at nooks and corners. Internal lock parts have the same high finish.

Cocking is very fast and smooth with the wide, target type hammer spur. The single action trigger on my gun trips at 44 ounces, breaking as clean as scored glass. With plenty of weight forward, and a Ace Trigger Shoe installed, the pull seems much lighter than it is. All contact points are hand honed at the factory, and no further tune-up is needed. All chambers align perfectly and the bolt fitting is extremely fine, with practically no play in the cylinder when the trigger is held back on all six holes. There is a whale of a difference in a revolver that is well fitted and one that is assembled!

Stocks are target type, full checkered walnut, well shaped for most hands and most use. Advanced paper punchers often add custom stocks in an effort to squeeze a couple of extra points out of a string. Some have the action shortened so the hammer has less travel. This functions single action only, with a reduced hammer blow that can cause erratic ignition, especially with hard primers in handloads. Colt's built the gun for positive ignition, and I think that for every point gained with an altered action you risk losing up to 10. Maybe I'm wrong; but the Colt factory won't do the alteration at any price. The fact that caps will fire is not proof of good ignition.

I like the floating firing pin built in the frame. Primers in hot loads won't flow into the firing pin hole to lock the cylinder. The ejector rod shroud is a good feature. The bore is .347 and the six left hand grooves, that are about twice as wide as the lands, are .354 diameter. Some Python owners will be surprised to learn the twist is 1-14.

Each Python is packed with a 15 yard arm rest target with all five wadcutters in one ragged hole. The gun holds the accuracy of the cartridge well, as I managed to shoot an equally good 25 yard group with Remington wadcutter fodder. I believe all revolvers shoot better after firing a few hundred rounds. One dealer converted several shooters to the Python by having them cock and dry fire at small targets in his store, while comparing with another gun. It's a good, simple test. Generally, the gun that stays on target best after the hammer falls is the one you can shoot best. A policeman packs his Python for service

use because he can shoot it much better than his service gun.

A plinking load that shoots well in this and other guns is the H & G No. 51 Sharpe bullet cast 1-15, tin and lead, sized .357, with 3 grains Bullseye in .38 Special brass, and Cascade primers. In Super-X .357 Magnum cases, a moderate load for small game is 6 grains Unique, or 6.5 grains Unique with the No. 51 H. P. bullet, with the hollow point pin adjusted for a $\frac{1}{4}$ " deep cavity. Unique is dandy for moderate loads, but is not suitable for high pressure charges.

There is no measurable variation in my Python chambers and cases fired with hot loads can be inserted in all chambers. Before firing Jim Harvey's "grizzly bear" loads, I miked the chambers and fired hot proof loads by remote control. There was no measurable chamber expansion, or indications of high pressure. I consider the listed loads safe in my Python. Due to component and loading technique variations, I advise cutting the top charges 2 grains, and working up. These reduced loads are accurate and still very powerful for heavy duty use.

Harvey's 127 grain jacketed Jugular gave very fine 100 yard accuracy with the top load, 19 grains 2400 at 1,951 f.p.s. and 1,072 f.p. M.E. Bullets were factory swaged .3555. I consider this the most accurate and deadly load in any .357 revolver, and certainly the best hunting bullet. Harvey's super varmint bullet, the 114 grain H. P. Jugular ahead of 20.2 grains 2400, listed at 2,025 f.p.s. with 1,043 f.p. M. E. causes even more tissue destruction on varmints. You have to see the damage to believe it! These were also factory swaged .3555. I have a number of reports of clean, one shot kills on big deer and black bear with both loads, although I think the 114 grain number is a varmint pill. Charges were carefully weighed. Cases were Super-X, trimmed to 1.284. Charges should be reduced in the short Remington .357 cases.

Colt guns may give higher velocity (and pressure) than listed, or equal ballistics could be obtained with less powder. Don't overlook the fact that Colt's 1-14 twist and tight bore really revs up these high-V pills. The bullet rotational velocity at 2,000 f.p.s. is an amazing 102,840 revolutions per minute! They penetrate $\frac{1}{8}$ " cold rolled steel plates like paper targets. Guns with a $1\frac{1}{4}$ " twist rotate bullets at 76,800 R.P.M. The faster twist may be why the Colt throws up a considerably larger rim and deeper crate in lead blocks. Rotational speed remains nearly constant at handgun range, compared with the fast shedding of muzzle velocity.

Lakeville Arms, Lakeville, Conn., makers of the fine Jugular bullets and swaging dies, have a new two cavity mould to cast their excellent Prot-X-bore bullets especially for Colt's. They weigh 142 grains when cast with pure lead. They are cast .356 diameter, the same as the 135 grain factory swaged Colt Prot-X-bore number, and top charges are the same.

I haven't shot this cast number yet, but Jim Harvey says it's excellent, and I think he knows more about handgun bullets than any other man. Prot-X-bores were the first accurate, Hi-V, pure lead bullets. Harvey proved the "experts" goofed in saying unlubricated pure lead wasn't suitable for bullets. I've used them with success and amazement since before they were marketed in 1952. Except for maximum velocity, they equal the Jugulars, known as "The Most Deadly Bullets," and they are cheaper to cast or swage.

The 135 grain swaged pill is extremely accurate and deadly with 15 grains 2400 in Super-X cases, starting at 1,575 f.p.s. Remington cases use 13 grains 2400. Either load is "sufficient" for most use, as pure lead delivers far more shock than is indicated by energy figures.

Prot-X-bores are inexpensive to make. SFM (Shoot From Mould) types, like the swaged numbers, eliminate sizing and lubricating. The savings in tin and lube will about pay for the zinc bases. They have superb target accuracy, as well as long range accuracy. Target charges can be too light. I suggest 3 to 3.5 grains Bullseye in .38 Special or .357 cases, with charges worked up for individual Python guns. The 135 grain swaged Prot-X-bore is the one I'd use to train for an important match, but the cast numbers are certainly capable of staying in the 10 ring. They are not temperamental, even with defects that would give flyers with conventional bullets. Perhaps the heavier powder charge necessary is the reason they are not more widely used in competition, but I can't see how a lighter bullet with less recoil and more powder is a handicap, and I believe they have an accuracy advantage.

NEW BULLETS AND LOADS IN HUNTING RIFLES

By Colonel Townsend Whelen

This spring I have been trying some new bullets and loads in hunting rifles, and the results may prove interesting to those preparing for the season's varmint and big game shooting. These accuracy tests were all 5-shot groups at 100 yards from the bench.

.243 Winchester Model 70 Varmint rifle, 26" stainless medium weight barrel, 6X Unertl Condor scope. 85 grain Sierra Spitzer bullet, 36 grains Ball C powder. Groups measured 1.65, .90 and 1.30 inch. Not so very small due to poor wind conditions, but interesting because this charge gives no wear whatever on the barrel.

.270 F. N. Mauser rifle, 4X Bear Cub scope. New 90 grain Sierra Open Point bullet, 45 grains 4895 powder. Groups .80 and 1.05 inch. This is a moderate load, M. V. about 3100 f.p.s. 50 grains of the same powder can probably be used with permissible pressure, but I was well satisfied with this remarkably fine accuracy considering the low power scope used. This bullet seems to equal the 110 grain Sierra Spitzer bullet which has made such a reputation for a varmint load in the .270 rifle, although I imagine the drop of the bullet will be slightly more (Continued on Page Eighteen)

THE SHOP

Roy F. Dunlap

Can't think of anything specifically helpful, so will just take a swing at .22 target rifles in general and maybe you shooters will start griping enough to get the factories to build them better. Then I won't have to work so hard to make them work right.

Not counting the Russian models which aren't exactly available, and the few custom actions out, I can't think of a single .22 action made anywhere in the world that comes close to perfect. The Finnish Lion is nearest, but it could use two locking lugs instead of one and maybe a better firing pin system. At least it has a full-grown thread for barrel shank, a strong, flat-bottomed receiver and uses a good trigger system, either 3 lb. or match type.

U. S. manufacturers consistently miss the boat, seeming to miss the boat deliberately by making triggers unnecessarily complicated to incorporate bolt stops and safeties, resulting in involved and inefficient assemblies. When Winchester revamped the 52 and came up with the C model, that did it! Instead of reverently laying the 40-year old design away and making a new rifle that could be both better and cheaper to manufacture, ugh . . . Someone should tell them that modern turret lathes and milling setups work even better with hexagonal stock than round bars, so a receiver could hold still in the stock. And a good reliable trigger could be made for about four bucks if they'd just use a spring plunger setup or even a screw through the receiver for a bolt stop. I see very few .22 target shooters using magazines or safeties, either. Elimination of them could save bucks and leave enough wood in the stock to hold the receiver.

Remington almost made it with the 40X. It's almost made simple and cheap enough to be good. If you didn't need an extra couple inches on your right arm to load the thing and they'd omitted the safety-sear so that they could have room for a sear wide enough to hold a good pull, it would be a pretty good rifle.

The foreign jobs don't make it either . . . the pinned barrels in Hammerli, Walther and Anschütz should be threaded, and the round receivers no better than the 52. Trim your fingernails if you use a Hammerli, otherwise you may put dents in the receiver handling the rifle. Walther and Anschütz seem to hold together pretty well, and the factories test-shoot them, so the barrels perform when you get them. If the barrels don't stay inside the metric X-ring at 50 meters, they end up in the .22 sporter department, not on a match firing line. Both of them have some excuse for a safety, though—it is part of the bolt and necessary to the bolt take-down assembly. Trigger assemblies take too much removal of wood in the stock for the round receivers, but at least they don't have magazines and do have back end squared to allow some bedding and recoil areas. Anyway, the barrels float and shoot.

A perfect .22 match rifle action is about the simplest that can be conceived, it doesn't need a safety, a magazine, machining to eliminate weight, or even a loading ramp. The boys want to push the hulls in by themselves anyway. I don't think shooters would squawk if it cocked on closing, as pushing the bolt handle three-sixteenths of an inch or so against the firing pin spring isn't going

to tire you out much—and the rifle would practically extract and eject automatically when you lifted the bolt handle. This would do away with some fairly precise and expensive milling of cams here and there in receiver and bolt. The steel can be easy-machining carbon type capable of taking case-hardening or carburizing without deforming under heat. The tough alloys are difficult to machine cleanly and are totally unnecessary in a .22—or a big rifle, for that matter. The old double-heat treated carbon steel 1903 Springfield actions are smoother in operation than the later nickel-steel type, and equally strong. Placing the .22 cocking-piece or sear contact on firing pin at rear end, as in the 40X, allows all sorts of freedom in trigger mechanisms—three-pound no-movement-felt type to Mauser double-sets. If Mat Canjar didn't have to put in extra springs, hooks, etc. to get the sear out of the way for bolt removal, he could make a match trigger that would last as long as your triggerfinger. Providing you keep your screwdrivin' paws off it and not try to shoot gallery with a 10-oz. pull! There's no cure for cutting engagement down until there isn't any holding area between trigger and sear.

May as well close with a mild pass at the sight makers. They are putting out pretty good sights, but should put in some stiff springs so that when you want to move one or two clicks, the spring pushes the sight for sure. And we can use finer adjustments—I think a 1/6 minute click would do, though 1/8 clicks wouldn't hurt. Bigger knobs would allow finer divisions without requiring a finer thread that would wear faster. Eventually we are going to smaller 10 rings. England has already done so. Our National Match Board has reduced the V-ring on the A target to 4 inches (4" at 300 yards is going to make a real sight-setting important). The 1958 ISU 50 meter target is a lulu—I had a 383 last month in California, prone, believe high was 391. I'm not too stupid a prone shot when I'm working at it, and I was working. If the sight picture ain't exactly perfect, you got a nine. Wind you ignore normally at 50 yards gives you a wide nine. Miss any change and you got an eight. It makes you work, and I for one like it. Scores are all relative of course, and it helps only your ego to say your DeWar score was 400-22x when the winner had 400-36x. Anyhoo, to zero-in perfect on this target you need a sight that both moves positively and a little at a time. You'll also find that you need a better-shooting rifle.

My sole business is the manufacture of custom target rifles and equipment of all types, and I may sound silly for advocating top-quality over-the-counter arms. But it seems even sillier to pay \$180 or so for a .22 target job, then worry about buying bedding devices, Johnson or Douglas special barrels, custom triggers and stocks before you feel equipped to win a rifle match. If a top rifle were available, we custom suppliers would still be behind on orders, for someone always wants or needs something different. I might get caught up enough to start advertising again.

REMINDER: Precision SHOOTING subscription rates advance July 1, 1958. New subscriptions, renewals and extensions accepted at the old rates if **post-marked** prior to July 1, 1958.

THE TOURNAMENT CIRCUIT

AT LOS ANGELES, CALIFORNIA

Adolph R. Willbrandt of Montebello, Calif. beat 32 other master class shooters to win the Western Nationals Small Bore Rifle Championship at Los Angeles, May 3 and 4, 1958. Willbrandt won only one fired match, the 50 meter metallic with 399-24, but won the metallic sight aggregate on Saturday with 1595-94, closely crowded by George Stidworthy, Jr. of Prescott, Ariz., a former New Jersey shooter, with 1594-113 and Wm. J. Grater of Oxnard, Calif. with 1594-101. Willbrandt dropped only one point with the glass sights on Sunday while Stidworthy dropped three and Grater lost four, to finish in that order in the grand aggregate: Willbrandt 3194-218, Stidworthy 3191-241 and Grater 3190-220.

Following in the grand were: 1st Lt. Haril W. Newton, USMC, 3190-213; junior shooter Jimmy Williams of Pasadena, 3189-217; S/Sgt. Emmett D. Duncan, USMC, 3188-191; Clifford C. Pierson, Sun Valley, Calif., 3187-233; Ruth A. Tohill, Woodland Hills, Calif., 3186-220; James A. Bell, Santa Monica, 3186-208; and Sgt. Robert I. Davies, USMC, 3184-195. Warren Winovich, Menlo Park, Calif. was high Expert with 3174-192. Bill Atkinson of Atkinson & Marquart Rifle Co., Prescott, Ariz. was high Sharpshooter with 14th overall ranking score of 3178-188. Charles B. Ash, USMC, Camp Pendleton, was high Marksman with 3145-165. All grand aggregate class winners were awarded \$100 for expenses to attend the National Matches.

James Bell shot the only any sights 1600 possible to win that aggregate. Ruth Tohill was second with 1599-127 and Lt. Newton third with 1599-126.

Match winners with metallic sights were: Dewar Course, Grater, 399-29; 100 yards, Jimmy Williams, 400-27; 50 meter, Willbrandt, 399-24; 50 yards, Stidworthy 400-32. Winners with any sights were: Dewar Course, C. F. Blackmer, Los Angeles, 400-34; 100 yards, Lt. Newton, 400-34; 50 meters, Ruth Tohill, 400-35; 50 yards, Stidworthy, 400-36 (Ruth Tohill also 400-36).

There were 88 registered with 67 shooting metallic sights on Saturday and 71 shooting any sights on Sunday.

CONNECTICUT SMALLBORE MATCH

The annual Connecticut Smallbore Spring Championship, sponsored by the Middlefield Rifle Club, opened the tournament season on the Blue Trail Range, May 4th, with 79 competing, plus 15 juniors firing the junior match only. A wet but windless day resulted in unusually high scoring on this normally tough range. A healthy note was the 20 odd unclassified shooters competing in their first registered match.

L. F. Moore of Aberdeen, Md., won three of the four matches (all any sight events) and the grand aggregate with a possible 1600-145x score. John J. Crowley, Hamden, Conn., tallied 1600-135 and Edw. H. Lane, Gloucester, Mass., took third with 1600-122. (Possible 1600 scores are not commonplace on this range.) Frank E. Eichler, Flushing, N. Y., led the Expert class with 1597-119 over Dana Cahoon of Boxford, Mass., with 1597-103. Karen Carten, junior girl from Stratford, Conn., was high for the combined Sharpshooter-Marksman class with 1593-116.

Moore won the 50 meter match with

a 400-36, one X up on Crowley; the De-war Course with another 400-36; and the 100 yard match with 400-37. Don Miner of Orange, Conn. took the 50 yard event with a 400-39, while H. E. "Tiny" Helwig and Crowley each posted 400-38 scores.

CONNECTICUT HIGH POWER RIFLE

On May 11th, 155 riflemen competed in the annual Stewart Match (Big Bore individual and team competition) at Blue Trail Range in Wallingford, Conn.

Young Joe Skrzyniarz of Meriden, who won both the senior and junior state gallery rifle championships in March with new record scores, did it again with the high power rifle. He scored 50-10V prone and 50-8V standing for the 100-18V aggregate to win the individual match with another new state record. To make it more astounding, this was Joe's first try at high-power rifle tournament competition.

G. W. Jacobson of Wallingford tied the former record of 99 for second best. He also scored 50-10V prone, but a 49-4V for second high standing score.

Middlefield Rifle Club won the team match with a five man team score of 480-56V over Quinnipiac Rifle Club of New Haven with 476-48V.

All shooting was at 200 yards on the Army A target. The individual match was classified by the Lewis System.

SHOOTS RECORD 300 METER SCORE

1st Lt. Daniel B. Puckel of Army Advanced Marksmanship Unit fired a score of 1138 to set a new U. S. record for the ISU 300 meter course at the preliminary International Team tryouts at Fort Benning, Ga., May 10th. Puckel also posted high score of 1117 in the 50 meter three position try-out match.

1st Lt. James S. Carter of AAMU was runner-up to Puckel in both events, scoring 1113 at 300 meters and 1104 at 50 meters.

Joe Deckert of Deming, New Mexico, scored 353 out of a possible 500 for high score in the Running Deer event. Major Ben C. Curtis, USA, was runner-up with 344.

ARMY HANDGUNNERS WIN AT DALLAS, TEXAS

Three AAMU handgunners from Fort Benning, Ga. took the three top aggregate spots for the 32nd annual Southwestern Pistol Tournament at Dallas, Texas, April 26-27.

Lt. Col. William Hancock was winner with 2628, M/Sgt. Richard Stineman was second with 2615, and CWO Oscar Weinmeister was third with 2613.

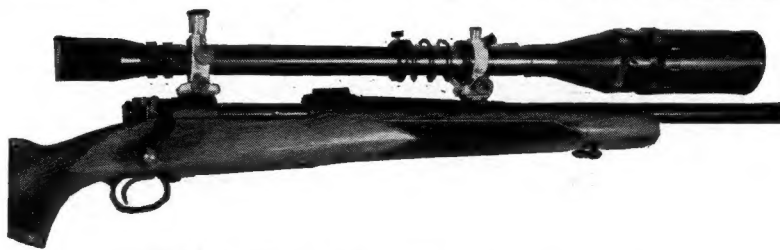
Col. Hancock fired a 2611 score to win the individual aggregate at Kansas City, Mo., the following weekend. The next four high aggregate scores were all fired by Army AMU shooters.

PRELIMINARY TRYOUT AT MURRYSVILLE, PENNSYLVANIA

Thirty-two competed in the preliminary International Team tryouts at 50 meters at Murrysville, Pa., May 17-18.

Gerald Ouellette, a gold medal winner for Canada in the 1956 Olympic shooting but now living in Michigan, fired top score of 1094-10 and also shot high standing score of 352. In addition he fired the only 10 shot possible of the match.

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HUTCHING'S RIFLE STOCKS



BY ROTHSCHILD

Hutching's rifle stocks are the first choice of experienced shooters. The beauty of the wood—the precision of the 95% finished machine-inletting make for a stock that is truly a pride and a prize. The Sporter Stocks boast the same fine features as the Marksman Stocks (see article, p. 44, September '57 Rifleman.) Write for catalog. Dealer inquiries invited.

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Bill Roos, Sharon, Pa., led the junior contingent and most of the seniors with second high score of 1092-13. His kneeling score of 372-4 was high in this department. Bill Cleary of Elwood City, Pa., shot 370 for second high kneeling.

Barry Trew, Bentleyville, Pa., firing in the most difficult relay of the match, came through with third high 1085-10, despite strong and gusty winds.

Jilann Brunett, Grand Rapids, Mich., a young lady already well known to Michigan gallery shooters, and Bob Moore, Claysville, Pa., shared high prone honors with 389-5 and 389-9. Bob's score is particularly noteworthy as it was fired on the Sunday afternoon relay in winds more typical of March than a sunny afternoon in May.

The match was operated on a do-it-yourself basis with competitors hanging their own targets and backers. Firing was in a series of 10 shot strings with additional sighters allowed as provided for in the ISU rules.

The Anschütz Mod. 54 Supermatch showed quite a gain in popularity being

in the hand of 11 competitors, and accounting for 6 of the first 10 places. Match winner Gerry Ouellette used one of these rifles. Bill Roos used a Win. 52 with a thumbhole stock in taking second place. Thirteen 52's were in service on the firing line, over half being radically modified by the addition of thumbhole stocks, special triggers, buttplates and other gallery and free rifle equipment. Barry Trew used a Dunlap equipped Rem. 37, as did four other competitors. Two used the BSA and one a Rem. 40X.

Sixteen shooters used Mark III of various lot numbers, 7 used EZXS, 8 Remington Match and 1 Peters. (I am amazed at the number of shooters who never clean their .22 match rifles—this as a result of inquiring about the effect of using Mark III. Of those who do, ringed barrels were all too common. Most say that accuracy is not directly affected but that the tendency to lead is increased, which does affect accuracy.)

The Murrysville range has 12 firing points, covered and enclosed by a permanent wooden shelter. The cement paved (Continued on Page Sixteen)

National Bench Rest Shooters Association, Inc.

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PLAYING GAMES

By Roy E. Meister

(Editor's note: Roy Meister was one of the promoters of the original Puget Sound Snipers Congress matches in Seattle in 1944, from which has developed our modern bench rest rifle competitive program. He was one of the organizers of the present NBRSA, as a representative from the Northwest area. He has been constantly active in assisting in conducting bench rest competitions in his area and in personally experimenting toward improved rifle accuracy. While one may not agree with him entirely, or at all, one must respect his sincerity.)

In order to play games we must have rules and these rules for the Bench Rest Game are the topic of this article. We often speak of the Bench Rest game, or the pistol or rifle game. Just what do we mean—and do the competitors in these games clearly understand the game?

In the February issue of Precision Shooting, Phil Teachout very appropriately introduced this problem with his article entitled "Shooting Games." He touched the nerve center of the current controversy over resting devices with the following statement: "The bench rest rifle shooting game has one big and important difference from other shooting games. The purpose of the competitions is to prove the worth of the weapon in accuracy instead of to prove the skill of the person in shooting some particular

type of weapon. That purpose has been clearly understood from the start of the game. The rifles were shot from rest in order that the human errors of holding and aiming might be kept to a minimum, to gain the fullest potential accuracy of the rifle-ammo combination. When the present National Bench Rest Shooters Association was organized in 1951 the first stated purpose of the organization was: 'The development and encouragement of extreme accuracy in rifles, ammunition, equipment and shooting methods.' That still stands as the first purpose of the NBRSA. Shooting rules have been, and still are, very few, simple, and only such as necessary to provide EQUALITY OF OPPORTUNITY IN COMPETITION."

To further clarify this problem let us understand that there is a movement in the East to modify the rest rule so that sand bags will be almost essential as a part of every rest. Felt pads might be used under restricted conditions. The stated purpose of the proposed new rule is "to prevent the rifle from returning to exact battery between shots."

I fail to understand the thinking behind a rule to force a confirmed bench rest experimenter to use a bag of sand, or a bag of felt, for a rest. How can such a rule conform with our purpose to develop and improve accuracy? It seems to be a movement to stop where we are now, or even a step backward, to eliminate the precision portable rests already developed in order to give the sand bag supporters an even break. I, for one, would like to see all these new shooters and prospective members who will spend the amount necessary to obtain or produce the competitive bench rest equipment required today, and then expect to test this fine equipment from a bag of sand, or a sack of felt.

It has been perfectly clear for at least two years that most of our local bench rest shooters (Northwest Region) quit the game because their equipment would not produce the groups that they knew it should, and were necessary in order to win, even occasionally. I believe their basic trouble was the system of resting on shifting sand and felt. Actually their guns and ammunition would shoot much better than they could hold on these antique type rests. Had they graduated to a scientific advanced type of portable precision rest that would RETURN TO BATTERY FROM SHOT TO SHOT, they would still be attending the matches and enjoying the GAME.

I do not believe the bench rest shooters want to PLAY GAMES FROM SAND BAGS at our big sectional matches. I think the real reason they attend is to prove to themselves that the fine guns and ammo they produce and test in their basement laboratory can be transported anywhere and proven to perform any place, from a standard bench at the standard range. They may not expect to win or set a world record (these are the freaks) but they do expect to equal their home tests and results. This is what keeps the so called GAME alive and growing slowly and surely.

I would like to offer a suggestion to our bleeding heart members who are worrying about the loss of new members because rests are getting refined and perfected. WE ALREADY HAVE AMPLE RULES and the method is simple. Just rotate the shooters from bench to bench after every relay, and shift the

BENCH REST MATCHES

EASTERN REGION

SOUTHBORO, MASS.: June 29, Aug. 17 (registered shoots), Oct. 12 (not registered); Southboro Gun Club, J. W. Baldwin, 5 Milk St., Westboro, Mass.

STAUNTON, VIRGINIA: July 26-27, Oct. 4-5 (registered shoots); Stonewall Rifle & Pistol Club, J. W. Perry; 409 Du Pont Ave., Staunton, Va.

PLAINFIELD, NEW HAMPSHIRE: July 20, Sept. 14 (registered shoots); Plainfield Rifle Club, Leslie R. Stone, Sec., Plainfield, N. H.

AUGUSTA, OHIO: June 14-15, July 19 (night), Aug. 2 (night), Aug. 30-31 (all registered shoots); Reeds Run Rifle Range, P. O. Box 66, Augusta, Ohio.

WILKES-BARRE, PA.: Aug. 2-3 (registered); Wilkes-Barre Rifle & Pistol Club, William C. Deets, Sec., Pole 141, Harvey's Lake, Pa.

LEWISTOWN, PA.: June 21-22 (Pa. State Champ.), July 5-6 (Eastern Region Championship) (registered shoots); East End Blue Rock & Sportsmen's Club, P. J. Auran, Milroy, Pa.

EASTON, OHIO: June 29, Aug. 17 (registered shoots); Chippewa Rifle Club, Donald Snyder, Sec., 260 Clinton St., Doylestown, Ohio.

ALTOONA, PA.: July 13 (Eastern Region Varmint Rifle Championship), Aug. 10 (registered shoots); Altoona Rifle & Pistol Club, John Kaylor, 709 4th Ave., Juniata, Altoona, Pa.

JOHNSTOWN, N. Y.: Labor Day weekend (registered); Pine Tree Rifle Club, Inc., Wm. N. Hare, Sec., 49 Woodside Ave., Gloversville, N. Y.

TERRE HAUTE, IND.: July 26-27, Sept. 20-21 (Invitational registered); Locust Grove Rifle Range, F. S. Yenowine, 1401 North 13th St., Terre Haute, Ind.

WINDSOR, ILL.: June 22, July 13, Sept. 7; Windsor Rod & Gun Club, Inc., Windsor, Ill.

GREENUP, ILL.: June 29, Aug. 17 (varmint—not registered), Sept. 13-14 (Illinois State Championship); Cumberland County Sportsman Club, Inc.; Herschel E. Owen, Casey, Ill.

MID-CONTINENT REGION

ST. LOUIS, MISSOURI: June 15, Sept. 14 (registered); Bench Rest Rifle Club of St. Louis, James R. Ernst, Sec., 2230 Ferncliff, Kirkwood 22, Mo.

TULSA, OKLAHOMA: June 21, July 19 (night); Aug. 9 (night), Sept. 6 (all registered shoots), September 26-27-28 NATIONAL CHAMPIONSHIP SHOOT; Tulsa Bench Rest Rifle Club, R. G. Berry, Sec., Pawnee, Oklahoma.

WICHITA, KANSAS: July 4-5-6 (Kansas State and Regional Championships—nights), Aug. 2 (night), Aug. 30-31 (nights), Oct. 5 (all registered shoots); Wichita Bench Rest Rifle Club, Dale Apperson, Sec., 935 No. Doris, Wichita, Kansas.

NORTH CENTRAL REGION:

BUFFALO, WYOMING: July 12-13 (nights); Buffalo Outdoor Rifle Club, C. C. Hankins, Sec., P. O. Box 151, Buffalo, Wyoming.

CUSTER, SO. DAKOTA: June 29, Aug. 16-17; Black Hills Bench Rest Rifle Ass'n, c/o Walt Siewert, Custer, So. Dak.

GULF COAST REGION

CORPUS CHRISTI TEXAS: Aug. 31 (registered shoots); Cleman B. Brown, 602 Sorrell St., Corpus Christi, Texas.

SOUTHWEST REGION:

YREKA, CALIFORNIA: July 19-20, Aug. 30-31 (not registered—Open and Varmint rifles); Yreka Rifle Club, Ray E. Jones, 508 Knapp St., Yreka, Calif.

position of the targets about twelve inches every relay. No MACHINE REST can be moved from bench to bench and adjusted from target to target WITHIN THE EXISTING NBRSA PRESCRIBED TIME LIMITS. These must be strictly enforced. Our existing rules for time limits and targets will control the type of rests, and prevent machine rests. It is commonly known that any truly accurate machine

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August 30 and 31, 1958

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SID BLAKE

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rest is heavy and awkward to move, and very slow to adjust on the target. In fact, with a true machine rest, the target is always placed where the bullets hit—no sights are used. It is high time we quit using the words MACHINE REST as a straw man to scare prospective new members.

The new, modern, portable, precision rests now being developed by the bench rest shooters are here to stay, and they are really as necessary and wonderful as the improved barrels and bullets, which seem to be accepted without objections—in spite of the fact that they are also not easily available to the new shooters.

Any new bench rest shooter equipped with a good portable precision rest can truly find out if his combination of rifle, sights, and ammo are performing, and he can go to a match and obtain satisfactory results—that is, good enough to come back and try again, with improvements. But this same shooter using sand bags or mush bags for rests, will come out once or twice and become so discouraged that he never returns.

A REST THAT IS CAUSING CONCERN

Quite a few of the eastern bench rest shooters know that Lawrence Rucker of Akron, Ohio, created quite a stir at the Elmira meeting in February, when he proposed that the precision pedestal rests and supports be abolished and go back to smooth sand bags of some sort. Lawrence was still talking about it when he arrived at Staunton, Va., for the April 26-27 matches. In fact he proceeded to make his point clear to the fellows Friday night. He brought out his Varmint rifle, which meets NBRSA requirements 100%, and his front and rear rests, which also meet NBRSA specifications 100%. With about a dozen fellows around, he sat down at the bench and sighted the rifle on the target. Then he loaded the rifle, standing upright, and moved it into battery position. Ed McNally, from a standing position, touched off the shot. With no one looking into the scope, the rifle was loaded again and moved into battery position, and this was pure guess as there was no stop on the front rest to make it come back to a definite position. Ed then touched off the second shot, and so on until five shots were fired. No one looked through the scope until all five shots had been fired. Three of the shots are in the same hole. The other two are perfectly in line but a little low. (Editor's note: The target was submitted for examination and is as described.)

The consensus of opinion of all who witnessed this shooting and the others who were told of it, are perfectly in agreement with Lawrence Rucker; that this type of rests and shooting should not be permitted. This would not offer any encouragement to new shooters, or to encourage interested spectators to become bench rest shooters. It is true that every shooter could have the same thing, but a great majority are not capable of making this type of rests, and some can not afford to have them made.

Lawrence Rucker did not shoot with this rest in the matches. There were some shooters who used similar type rests in the matches, and with lucrative results.

Jim Perry

THE MEMBERS FORUM

Dear Mr. Teachout:

I hardly ever get around to putting in my two cents in a controversial issue such as the extra target for the new Na-

tional Match Course. I just sit around and gripe after it has happened, like a lot of others.

To me, this bench rest shooting is very much like auto racing, or motorcycle racing. In either one of the three sports, games, or competitions, a lot of work is done on the machine or rifle to be raced or entered in competition. It is certain that a lot of testing must be done on machines and rifles to get them in condition for competition.

A lot of races are won by the unknown but diligent driver or shooter who sees to it that his machine is tuned up to peak performance before he entered a race. Like the race driver who does not correctly adjust his speed and spins out on a turn, the rifle shooter can make an error in judgment and lose a shot where it hurts. However, the race driver does not get a chance to "cull" that heat. The idea of the race game is: "if it won't run you shouldn't have brought it to the track." I am inclined to feel the same way about "rifle racing."

I may be the first to disqualify at the next match but I won't cry because a younger shooter managed to complete the course. If this proposed new ruling is supposed to help the inexperienced shooter—I can't see it. Judging from the National Shoots in the recent past it seems that the "inexperienced" shooter is doing all right the way things are.

Let's play the game like gentlemen and let every heat count.

Cecil Robinson
Houston, Texas

REINFORCED ACTIONS

(An excerpt from a letter from Paul O. Gottschall.)

Your experience with the Wasp (on Springfield action) brings something to mind that I have often heard quoted but never in print. That is that the Mauser or F. N. action is for some reason unsuitable for floating barrels unless it is reinforced, and while I will not say this is a positive fact my experiences do bear it out.

I nearly drove myself nuts trying to make my first .222 shoot, using a regular F. N. action with the magazine cutout filled and silver soldered in on the bottom. I had my first Hart barrel on this job and it would outscatter anything I ever saw. That was in early 1954. I reinforced the action by welding a filler across the receiver bridge and cut the barrel to 27 inches, and instantly had a really hot rifle. This, incidentally, is the rifle I have used in 90% of the matches I have fired since that time (it has been rebarreled twice since).

Tried the same on another F. N. and it produced one of the hottest varmint rifles in the country.

Taylor & Robbins hood—Bellows Sleeve—and John Warren's "Strong Back" all serve the same purpose—and I am for them all.

STOCK BEDDING CAN CHANGE

By Wm. E. Cotter

An experience that I have very recently had has re-convinced me that the stock is a **very important** factor in influencing the accuracy that can be obtained from a rifle. Stocks, including laminated stocks, are subject to warping and an occasional check could insure better accuracy.

On one of my bench rest rifles I have a 9 piece laminated stock, which is about three years old. This rifle was last fired in June 1957 at the Wilkes-Barre, Pa. match where, with conditions (Continued on Page Twelve)

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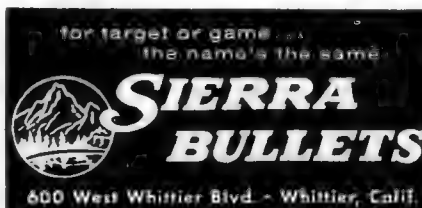
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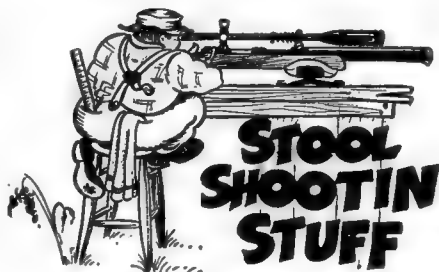
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about three years ago and has always shot well up until this Spring and I can not figure out why it did change after laying perfect for the first two years. I do not feel it was any condition in my gun room, since I shot two other rifles that have been stored right near it and both shot as good as last year.

All the shooting this Spring has been done with a machine-type rest and it hasn't been changed since I started to use it, and I am very well pleased with it. All human error possible was eliminated in these tests and the results obtained. When the rifle was pushed back into position it would be right on target perfect. In the early tests, one or two shots would go right out of the group, for no reason at all. In fact, I shot more groups than I should have, thinking it might be the rest was not working OK, and then checking with other rifles to make sure.

I feel there have been shooters that have lost confidence in a barrel because the rifle seemed to have lost its accuracy, when maybe a little checking of the bedding could have brought it back to its normal accuracy. I was very much impressed by what a little amount of wood I had to remove to make this rifle shoot again like it did the year before.

A shooters' proverb which is really true—a rifle will not shoot any better than the bedding of the rifle in the stock.

(Editor's note: Since the article "Checking The Action Bedding" by Ed McNally was in an issue of Precision SHOOTING of which back numbers are no longer available, we are herewith reprinting that article.)

**CHECKING THE ACTION
BEDDING**

First, with the rifle laid on the pedestal in shooting position, pass a double thickness of target paper between the barrel and barrel channel to make sure the barrel does not touch the forearm wood.

If the paper can be passed freely between the barrel and barrel channel, then, get out your depth gauge. Stand the rifle perpendicular, on its butt, and with the depth gauge measure from the bottom of the stock (at fore-end) to the bottom of the barrel. Loosen the middle screw (when three action screws are used) or, better yet, take it out. Check your measurement to see if the barrel has moved.

Next take out the front guard screw and check measurement to see if there was any movement of the barrel. Put front guard screw back in, drawing it up to its original tightness. Remove rear guard screw and check measurement. Check all guard screws to see that they do not touch the wood in passing through the stock and that they do not "bottom" in the receiver. If there is any movement when any of the screws are loosened, especially the front or rear ones, your action needs rebedding. Here's how to do it.

Get yourself a 3/4 inch used file. Grind off the file teeth on both sides toward the end. Grind the end in a radius equal to a one inch circle, with a slight rake. You now have a first class scraper.

Smear the action with lamp-black. Put the action back in the stock and while in a perpendicular position tighten the rear guard screw **only**. Remove from the stock and scrape out all lamp-black marks. Continue to do this until you get an even bearing the length and width of the action, using the rear guard screw only. Then take a new measurement from bottom of stock at fore-end to bot-

Stock Bedding Can Change

(Continued from Page Eleven)

hot with mirage, it averaged .461" for five 10-shot groups at 100 yards.

This Spring I check-shot the rifle at the range during the months of April and May, all firing done under good conditions, and resulting groups were as follows: Eight 10-shot groups at 100 yards averaged .58", the groups running from .47" up to .73". Thirteen 5-shot groups at 100 yards averaged .44" with individual groups from .26" up to .73".

The rifle has a stainless steel barrel with only 600 rounds fired through it and I was sure something must be wrong as the groups were larger than with another rifle shot at the same time and much larger than the test groups fired before the 1957 Wilkes-Barre match, under good conditions. The stock, as I said, has been used for the past two seasons without touching it.

I checked the stock by Ed McNally's method, which was published in Precision SHOOTING (May 1956 issue). By this method I measured the distance from the bottom of the barrel to a mark I scribed on the end of the forearm, and then removed the middle screw. I then removed the front guard screw and re-measured the distance from bottom of barrel to my scribed mark, and the barrel had swung out 10/32 inch from my measurement with the front screw drawn up tight. I then screwed the front screw back in and removed the rear guard screw, and the barrel again changed distance.

I put lamp black on the action, which is a Rem. 722 with magazine cut filled in, and found the stock bearing harder in middle on right side and also in middle on bottom. After continued scraping, I could remove either front or back screw and the barrel would not move at all. I also had to do a little rebedding both at front and rear to get a perfect bed.

On taking the rifle to the range for check firing it really perked, averaging .34 inch for five 5-shot groups at 100 yards, the smallest being .28" and the largest .41". In the groups fired before correcting the bedding, many of them were enlarged by one or two fliers. In the groups fired after correcting the bedding the fliers disappeared.

This stock was bedded perfectly

TO THE MATCH SHOOTER

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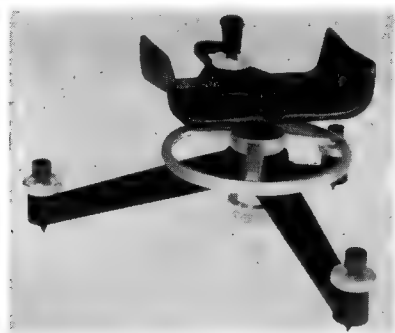
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tom of barrel. Put in the front guard screw, tighten and check the measurement. If there is no change you are all set. If there is a change, keep on scraping until there is none. Don't expect to do this in ten minutes. Sometimes it takes from three to five hours.

Next, smear the recoil lug and keep scraping with a pen knife until you have a full, even bearing. Make sure the recoil lug does not touch at the bottom or sides—all bearing should be on the face.

STOOL SHOOTIN' STUFF

Dear Phil:

I will be seeing you almost as soon as you get this letter as I certainly expect to meet you at the Plainfield shoot. I am looking forward to that get-together with the usual amount of enthusiasm which I always feel towards that shoot. I am glad to see that varmint matches are to be incorporated with it, and I hope that pattern is followed among the smaller shoots. There is no question in my mind but what the varmint rifle will shoot five shot groups nearly as good as the heavy bench rest job. I know that in many instances I have gotten group sizes cut in half for many of the local varmint shooters by indoctrinating them with some of the bench rest shooters practices in preparing ammunition and moderate modification to the way their actions fit the stock.

I sometimes worry when I get an order for some of my best grade bullets for some fellow who has been getting 3 minute groups and thinks that my bullets will bring him down to a half minute group. I generally send such a chap a dividend in the form of extra bullets and a few words of advice to him that may help him get some of the bugs out of his rifle before he wastes those good bullets for which he has paid me his hard earned cash. Good bullets won't make a bad rifle shoot well, probably won't even make it shoot well enough to notice that the bullets are good. The story is entirely different for a rifle that is shooting well because the good bullets reduce the lost shots to a minimum, shrink the average group and the aggregate gain from every angle, but the most important gain comes from the increased confidence that the shooter has through knowing that one of the bugaboos (erratic bullets) has been all but eliminated. I say 'all but' because I test my own bullets enough to know that even though I use exceptional care in making them, a flyer does seem to occur in rare instances. These instances are reduced to a minimum through careful measurement and selection of the jackets, as every fellow making bullets well knows.

Phil, I went to Staunton and had the usual good time. It was the opening one for many of us, and it was easy to see the enthusiasm is as high as ever. The weather man treated us more coldly than I expected and added insult to injury by sending enough rain down to make it tough on our equipment. The clothes worn for protection against cold and rain created some pretty weird sights. Some fellows were smart enough to take some things with them but most

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of us had to improvise and, even then, there were plenty of wet feet and red noses. All of the above didn't contribute to small groups but nevertheless there was some mighty good shooting that went on from relay to relay. I am sorry to say I wasn't among those who were making those small groups. There were a number of shooters who were determined to demonstrate that the existing rules permit devices that allow guns to return so close to battery that the affect of mirage can be largely disregarded. Wind, of course, must still be taken into consideration, but presuming the wind is constant or quiet, the gun can be slid back into position and fired by anybody at any time to make a small group without looking through the telescope. Not one person had these devices but at least a half dozen, and they all agreed that a lot of the pleasure was being taken out of the game as far as they were concerned. There didn't seem to be any resentment from those who did not use such gadgets but that is a hard thing to evaluate and only time will tell, providing the gadget craze continues. Everybody concedes that there is a need for accessories serving such a purpose for testing new guns, new loads or conditions but many feel that here the devices should stop. One of the guys who was particularly hard to beat was our friend "Cowboy" Bill Rucker. He has his ups and downs but on that weekend he had everybody looking from both ends of the line at his targets. He was situated in about the middle of the line and he was generally finished with his record group before many of the others were through with their sighters. With the use of his rests, in one instance when conditions were very favorable, he fired all 10 shots in considerably less than two minutes, to win the match without any very close competition. He had demonstrated those rests the night before, and at that time, and throughout the shoot, he strongly stated that they were ruining the game. On the night occasion, he took a varmint rifle, and a light one, too, set it in the rest, and moved away from the rifle and had Ed McNally fire the gun from a standing position without looking through the telescope. As I recall it, the group was less than one half inch but the amazing point was that three of the shots did not measure over three hundredths—not three tenths, Phil, but **three hundredths**. From the above, Phil, some readers may infer that I feel we should go back to shooting off of sand bags only, or as one fellow put it at one of the meetings, our doubled up fist under the butt of the rifle, and only a sandbag in front. That is **not** my wish, but I would like to see some middle of the road course established so that one rest has no restrictions of any sort to lateral movement and the other rest has no restriction to longitudinal movement. Either or both rests could have unlimited vertical adjustment. These basic restrictions would be broad enough to give us what we want for both the sporting

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elements of the game and top rate performance of the rifle. The result, of course, would be that the shooter who knew the gun, the conditions, and took every preliminary step to assure perfection would be most likely to win but I believe on the whole, the grounds would be more common for all whether they be new or old at the game. Now, Bill Rucker doesn't make or sell any device and thoroughly enjoys the game for the sport that is in it. I would almost say he would lay you a wager that the earth is square, and the story of some of his bets would make interesting reading for the columns of this or any other publication. The color and enthusiasm which he lends to the game are appreciated by those who know him well. Bill is only one guy. There are hundreds of others with like interests with similar ability and similar equipment. There must be fellows in the West who have the same feelings, and I cannot feel that any dyed in the wool shooter would drop out of the game because of mild and rational changes in the rules.

(Continued on Page Fourteen)

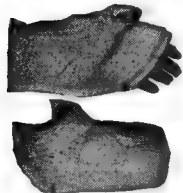
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Stool Shootin' Stuff

(Continued from Page Thirteen)

I am sure we are all happy to hear that Ed McNally is recovering nicely from his little bout with surgery, and I am one among many who look forward to seeing him competing as keenly as ever at the coming shoots.

One of the interesting home folks gadgets that I saw at Staunton seemed to be a brilliant little invention to save we harassed shooters a few dollars and was developed by Frank DeBaugh who competes with his son, Charlie, and the other boys around the Baltimore area. It doesn't equal the fine Taylor and Robins cleaning rod guide that I mentioned several months ago in this column but it does accomplish similar results. Frank found that an empty 20 gauge shot gun shell fitted nicely in the bolt way of most of the actions. He drilled the primer pocket completely through, slid it over his rod, and it effectively keeps the rod centered in the bore. A little wad of cotton stuffed down in the shell will keep the grit wiped off, and the shell itself protects the brush or cleaning patch from picking up dust if it is left at the business end of the rod when the rod is not in use. A neat little trick from a very nice guy.

Phil, the Stuhlschuters are not going to be able to get to DuBois as things look now so you'll have to get the news of that shoot, either as I get it second hand or from some of those who attend in case you do not.

Cordially yours,

Ernest Stuhlschuter

BENCH REST MATCH RESULTS

AT DETROIT, MICHIGAN

The first registered shoot conducted by the Detroit Bench Rest Club on April 20th drew 18 shooters, 7 of them shooting in the Varmint Rifle Class and 11 shooting unrestricted rifles. Five seasoned match shooters from Eastern Ohio competed, four with "open" rifle and one with Varmint rifle, but the Michigan shooters defended their territory very successfully.

Ernest C. Scafuri of Detroit was the outstanding winner with unrestricted rifle with an aggregate average for five 10-shot matches at 100 yards of .397". He shot smallest 10-shot group of the day, .275", and his biggest group was .460". He used a .222 Rem. case in Douglas barrel on reinforced Mauser '98 action, with Unertl 24X scope, and his load was 20.5 grs. 4198 with Brown 51 gr. bullet and Rem. primer.

Maynard J. Toutant of Garden City, Mich., had runner-up aggregate of .503", shooting a .219 Don in Douglas barrel on FN action with Unertl 15X scope, and load of 26.3 grs. 3031 with B&A 51 gr. bullets and Federal primer.

A. W. Johnson of Detroit was third with a .530" agg., shooting the .222 Rem. case in Apex barrel on Bellows reinforced action with Lyman 20X scope, and load of 20.5 grs. 4198, Brown bullets and Rem. primer.

Ohio shooters, Harold Haynam (.532), W. Brown (.538), Paul Gottschall (.539) and Omar Rinehart (.567), took the next four places. In 8th spot was Barney Muhleman of Detroit with .570" agg., shooting a .222 in Hart barrel on his own action, with load of 25 grs. 4320 powder, Speer 52 gr. bullet and Rem. primer.

Paul Gottschall shot a .080" group to win the 5-shot warm-up match.

Raymond A. Novak of Highland

Park, Mich. won the five 10-shot match Varmint Rifle aggregate with a fine .569" average. His smallest group of .280" was only beaten by Scafuri's .275" with heavy rifle, and his largest group was .750". He shot the .222 Rem. case in a 22 inch Apex barrel on Win. M54 action with Unertl 20X scope, the outfit weighing 11¼ lbs. His load was 22 grs. 4676 powder, Burger 55 gr. bullet and Rem. primer.

Lawrence Rucker of Akron, Ohio, shooting the .222 case in Douglas barrel on Sako action with Unertl 20X scope, weighing 12¾ lbs., was runner-up with a .622" aggregate. His load was 20 grs. 4198, Brown bullet and Federal primer.

The other five Varmint Rifle class shooters all shot factory rifles, two of them the M70 .243, and all had aggregates over minute of angle. This would appear to indicate that the quality custom built rifle pays dividends in consistent accuracy performance.

AT WICHITA, KANSAS

Thirteen shooters from Kansas, Oklahoma and Texas fired the National Match Course on cold, cloudy, windy May 4th at Wichita, Kansas.

Robt. W. Smith of Dallas, Texas, to whom adverse weather conditions appear to be only an interesting challenge, won all the aggregates, averaging .578 at 100 yds., .719 at 200 yds., for a NMC .649 M.O.A. Bob's young son, Jim, had runner-up aggregate at 200 yds. (.899 m.o.a.) and was third N.M.C. agg. with .897. Both shot the .219 Don case, Bob his A. L. Day barrel on FN action with Unertl 24X scope, and Jim an Apex barrel on Mauser action with Fecker 24X scope. Both used their own 53 gr. bullets and Federal primers but Bob used 27 grs. 3031 powder while Jim shot 28 grs. Ball powder.

H. G. Baucher, Kansas City gunsmith, was third at 200 yds. with .979 and second in the NMC agg. with .858 M.O.A. He shot a .219 Don in Douglas barrel on Enfield action with Unertl 24X scope and load of 28.5 grs. Ball powder, bullets made in B&A dies by Carden and Federal primers.

E. R. Carson of Muncie, Kans. was second at 100 yds. with .688 and W. S. Coleman of Burleson, Texas, was third with .693.

John Mayer of Mission, Kansas, shooting for personal record only, shot a .222 Rem. in a 13 lb. rifle with 22 inch barrel, 1.125 inch diameter full length, and made an agg. of .548 for five 5-shot matches at 100 yds., .957 at 200 yds. and .757 M.O.A. for the two range aggregate.

AT TULSA, OKLAHOMA

Eleven shot unrestricted rifle and three Varmint rifle on the new John Zink range at Tulsa, May 17th, under conditions reported as neither very good, nor very bad.

Horace Powers of Okmulgee, Okla., was second for the five 10-shot matches at 100 yds. with .489 ave., first at 200 yds. with .666, and winner of the NMC agg. with .577 M.O.A. He also shot small 100 yd. group of the day (.390"). He used the .222 case in a Hart barrel on his own action, with Unertl 24X scope, and load of 23 grs. Ball powder, his own 50 gr. bullets and Western primers.

W. C. Farrar, Grand Prairie, Texas, was third at 100 yds. with .553, second at 200 with .811 and second for the NMC with .672. He shot a .222 in Hart barrel on his own action with Unertl 24X scope and load of 23 grs. Ball powder, his own

bullets made in B&A dies and Rem. primers.

H. G. Baucher of Kansas City, shooting the same outfit as at Wichita two weeks earlier, was third at 200 yds. (.866), fourth at 100 (.539) and third in the NMC agg. with .702. W. S. Coleman of Burleson, Texas, was first at 100 yds. with .484, and fired the only group under an inch at 200 yds. (.979") but ended up fourth for both 200 yds. and the NMC agg. He shot a .222 in Hart barrel on S&I. action with B&L 8-24X scope and load of 23.5 grs. Ball powder, his own 55 gr. bullets made in B&A dies and Rem. primers.

David Schockley of Okmulgee, Okla., shooting a .22/250 case in A. L. Day barrel on Mauser action with B&L 6-24X scope, total weight 12½ lbs., with load of 31.5 grs. 3031 powder, Neumann 50 gr. bullets and Federal primers, shot five 5-shot matches at 100 yds. for an agg. ave. of .840, the same at 200 yds. for .7576, and a two range agg. of .7988 M.O.A. Jack Sloan, also from Okmulgee, shooting a .222 factory Sako with 23 grs. Ball powder, Neumann bullets and Federal primers, made a 100 yd. agg. of .733 but went to 1.235 M.O.A. at 200 yds.

AT STAUNTON, VIRGINIA

Thirty seven shooters arrived for the Stonewall Rifle and Pistol Club April 26-27th bench rest matches. It had begun to warm up again and some of our fruit trees were in blossom. We had high hopes for a balmy weekend for the matches. It was pretty nice up to Saturday which was an overcast day but still warm. We had our fish-tailing wind which baffled some of the shooters for the 200 yard matches.

Chet Benjamin fired smallest 5-shot group at 200 yards (.376") and Lawrence Rucker fired a .594" 10-shot group, which established a new range record. Chet Benjamin won the five 5-shot match aggregate with .471 M.O.A. and Irv Mohnkern was second with .479. Paul Gottschall won the five 10-shot match aggregate with .570 M.O.A. and Rucker was second with .616.

Sunday was the day of days! Cold, raining off and on until about noon the rain came and it finally stopped Monday morning. In spite of the miseries, only four shooters failed to finish the 100 yard matches.

Harold Haynam fired both smallest 5-shot group (.129") and smallest 10-shot group (.218"). Paul Gottschall won both the five 5-shot match aggregate (.229 ave.) and the five 10-shot match aggregate (.365" ave.) to put him first in the NMC agg. with .468 MOA. Bob Hart, who was third agg. at 200 yards with .653 and fifth at 100 yards with .429 was runner-up in the NMC agg. with .541 MOA. Donald Combs was 2nd in the five 5-shot agg. at 100 yds. with .261 and Chet Benjamin was 2nd in the five 10-shot match agg. with .403 to give him 3rd spot in the NMC agg. with .544.

In caliber's used, 21 shot .222's and the rest .219 Donaldson Wasps.

The foundation footings are poured for our new club house and the block walls will start shortly. We are confident that we will have roof on by the July matches. If weather prevails as it did for this match they can back their cars under 80 feet of 8 foot porches.

Jim Perry
Gottschall, Bob Hart and Harold Haynam (NMC 5th with .628) all shot the .222 case in Hart barrels, Gottschall on his own reinforced action, Hart on Hart action and Haynam on Win. action,

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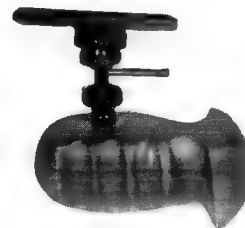
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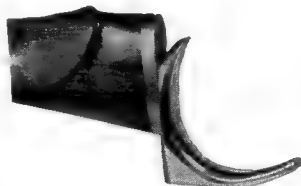


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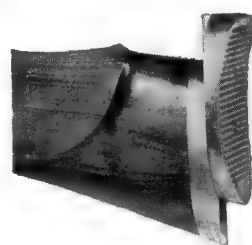


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(Continued on Page Sixteen)



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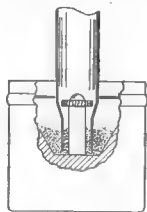
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Trophy winners at the California State Championship Muzzle Loader Matches. Standing, left to right, Guy Holden, Vic Corrello, Joe McPhillips. Kneeling, left to right, Geo. Barth and Bob Rosenbaugh.

The Tournament Circuit

(Continued from Page Nine)

firing line is divided into bays of two firing points each by baffles. The range faces an easterly direction and makes morning firing into the sun. The prevailing winds are from the west so that shooters are usually protected from the wind and weather.

William R. Funk

PISTOL TRYOUTS AT FORT BENNING

At the Preliminary International Pistol Team Tryouts at Fort Benning, Ga., May 17-18, 1st Lt. David G. Cartes of Army AMU fired a score of 590 in the rapid fire silhouette match to top the recognized world record score for this course by 4 points. Army shooters SFS Aubrey E. Smith (584) and SFC Lawrence K. Mosely (583) placed second and third.

In the slow fire free pistol matches, M/Sgt. Roy Sutherland, Army AMU, and William C. Joyner, U. S. Border Patrol, fired identical scores of 554 x 600. Army shooters SFC William Blankenship, Jr. (552) and SFC Arthur G. Ogden (551) placed third and fourth.

M-Sgt. Joe Benner placed sixth in each match with scores of 580 and 547.

Bench Rest Match Results

(Continued from Page Fifteen)

Douglas barrel on FN action and Rucker a Pidell built rifle with Pride barrel on Weber action. Benjamin used his own bullets made in B&A dies and Rucker used Brown bullets, both in 55 gr. weight, and both used 3031 powder and Federal primers. Benjamin used a B&L BALvar 6-24 scope and the other four used Unertl scopes, Rucker in 30X and the others in 24X.



Carl Fuller, Riverdale, California, with his .450 caliber slug rifle which he shot in the California State Championship Muzzle Loading Matches.

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| Exit Pupil | 6.3mm | 3.2mm | 1.6mm |
| Relative Brightness | 40 | 10 | 2.5 |
| Real Field (at 100 yds.) | 18 ft. | 9 ft. | 4.5 ft. |
| Eye Distance | 2¼" | 2¼" | 2¼" |
| Weight (including mount) | 36 oz. | | |
| Length of Scope | 22" | | |
| Windage Adjustment Range | ±20" at 100 yds. | | |
| Elevation Adjustment Range | $\left\{ \begin{array}{l} +30" \\ -10" \end{array} \right.$ at 100 yds. | | |
| Sighting-in Adjustment Ranges | 40" at 100 yds. | | |
| Windage and Elevation Adj. per Click (7.2" bases) | ¼" at 100 yds. | | |
| Windage and Elevation Adj. per Click (10.6" bases) | ⅛" at 100 yds. | | |
| Projected thickness of cross-hairs at center | ⅛" at 100 yds. | | |
| Projected thickness of cross-hairs at edge of field | 2⅝" at 100 yds. | | |
| Parallax Focusing Range | 50 ft. to Infinity | | |
| Price, including mount | \$160.00 | | |

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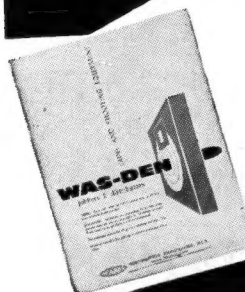
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New Bullets And Loads In Hunting Rifles

(Continued from Page Seven)

at long ranges than that of the 110 grain bullet due to the density and form of the latter bullet. It occurred to me to try this 90 grain .270 bullet with a light charge for use on small game and fur bearers where one does not want to spoil meat or pelts. I loaded it with 18 grains of 4198 powder, M. V. about 1700 f.p.s., and shot it at 50 yards. The first shot struck a half inch below the succeeding group, but the next five shots made one small hole .45 inch to its outer edges. Then on a retest, six shots went into .85 inch. With sights adjusted to strike two inches above aim with my big game load of the 150 grain Sierra boat tail bullet and 59 grains of 4831 powder, this small game load struck two inches below aim. This new 90 grain Sierra bullet seems to be most remarkably accurate.

.308 Winchester, 26 inch No. 4 Douglas Ultrarifled barrel, .308" groove diameter, 12" twist. 8X Lyman Junior Targetsport scope. So far this fine barrel has done its best shooting with Ball C powder, of which I am glad for the charges of this powder will not wear out this fine barrel. The 150 grain Sierra Spitzer soft point bullet with 46 grains of Ball C powder gave two groups measuring .95 and .80 inch, which is going some for a .30 caliber rifle. In my 26 inch barrel this charge gives about M. V. 2,800 f.p.s. I also shot the 180 grain Sierra Boat Tail soft point bullet with a charge of 43.5 grains of Ball C powder, giving groups measuring 1.30 and .75 inch, which is also excellent .30 caliber accuracy.

.30-06 medium weight Springfield, .308" grooves and 10" twist. Lyman 6X All American scope. The new 110 grain Sierra open point bullet with 53 grains of 4895 powder gave groups measuring 1.00 and .60 inch, which is also excellent for such a light bullet at high velocity in a .30 caliber rifle.

Please note that all the above shooting was with typical hunting rifles and with low power scopes. Due to the scopes used there was undoubtedly often an aim error perhaps sometimes amounting to a quarter inch.

THE INFORMATION BENCH

The Information Bench service is available to all Precision SHOOTING readers. With your questions, send a large, stamped, self addressed return envelope for a reply. Selected questions and answers, covering as wide a variety of interests as possible, will be published in these columns. Address your questions to the following people.

Bench rest, varmint and hunting rifles, accessories, handloading, components and shooting methods—M. H. Walker, THE INFORMATION BENCH, RFD #1, Box 118, Mohawk, N. Y.

NRA and Free target rifles and shooting—Roy F. Dunlap, 2319 Ft. Lowell Rd., Tucson, Arizona.

Sporting handguns and loading—Kent Bellah, Saint Jo, Texas.

British arms and shooting—John C. J. Knott, 2226 North Euclid Ave., Tucson, Arizona.

APPRECIATES HELP RECEIVED:

Dear Mr. Walker:

I certainly want to thank you for the information you gave me in your recent letter which enabled me to find a major source of shifting of point of impact in my Sako HB .222. (April 1958 P. S.)

The front guard screw just barely bottomed in the hole. In fact it was such a close fit that spotting compound plainly printed on the wood. But it was not a good enough fit to keep the stock and receiver from shifting. When I placed the stock in a vise, as per your suggestion, it took a real solid whack to make it move at all; several whacks showed a decided shift.

When I shortened the screw and drew it up tight the barrel bottomed in its channel where before it had been completely free. I took care of that temporarily with a pasteboard shim and took the gun out to see what it would do. I got the usual good groups but it shot five inches to the right from the former point of impact.

I always check the bedding of any rifle I buy before I even shoot it, but evidently spotting compound doesn't always find the defects. I had never thought about putting the gun in a vise.

I think this is a splendid thing you are doing for the shooting fraternity in helping them out like you did me. I just want you to know how much I appreciate it. Al Triggs, Melvern, Kansas.

Question: I have spent considerable time lately in checking handloads for concentric bullet seating and was surprised to find that none were perfect, and that the average were out of center .005". This reading was taken at a point about 3/16 inch from the bullet point. Calibers tested are .243, .30-06, 8x57, .300 Sav. and .308 Win. Cartridges were spun in V ways and checked with a Starret micrometer indicator.

I have not as yet had time to find out how much this affects accuracy but hope to experiment with it soon.

My press is R. C. B. S., also sizing dies. Seaters are Vickerman supposedly straight line seaters. Exception is 8mm where R. C. B. S. seater was used, also advertised as straight line.

With the great care that the bench rest shooters use in loading their ammo it doesn't seem that they would be satisfied with loads that are anywhere from .002" to .012" out of center. Thank you for any help you can give me. Seely Masker, New York.

Answer: Many bench rest shooters are using the so called straight-line seaters to attempt to improve on the eccentricity between bullet and case. I have no information on the measured improvement.

Two calibers, the 7.62 NATO and the .222 Rem. have been checked super-

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Anyone experimenting with .40 caliber wildcat handguns better ballistically than .400 Eimer, please write. Kent Bellah, Saint Jo, Texas.

PT Barrels: made in Hope Valley, Rhode Island, by J. A. A. Also standard twist in various and special contours. Deep Hole drilling and experimental work. Johnson Automatics Associates, Inc., P. O. Box 270, Hope Valley, R. I.

For Sale, S&W Perfected model, 8 inch, pretty good one, very fine shooter, \$65.00 cash. Unertl 1½ inch rifle scope, 24X, new, \$80.00. T. C. Rowe, 1137 Florence Ave., Colorado Springs, Colo.

WANTED—Early issues of SHOOTERS NEWS. Need 1947, all 1948, Jan. thru May and Aug. thru Nov. 1949, Jan. thru June 1950. Explain which you have, and price. GEORGE HENDRICKS, ETNA, CALIFORNIA.

ficially for bullet runout and subsequent accuracy. The 7.62 is capable of shooting ½" averages for 5 shots at 100 yards with runout up to .007-.008 measured by your method. The maximum group size in five groups was .65". The .222 averaged .33" with the largest group being .47". The .222 had a maximum runout of .005".

This does not mean that better groups would not have been obtained if the eccentricity were less. It does mean, however, that any test which demonstrates the superiority of absolutely straight seated bullets, using these components, will need to be a larger test than most individuals have either the time or the money to run.

Bullet and case eccentricity is not all caused by the bullet seater. The case wall at the neck may vary in thickness sometimes as much as .005" on some lots of cases. Bench rest shooters don't use these lots. The neck sizing tool can size the neck off center if the die is not perfectly round, smooth, and symmetrical, or if the ram is off center in the tool. In addition, all these things are aggravated by excessive expansion of the case neck in the chamber. This is caused by either thin case necks or large chambers.

All in all I would say you will need control over a fair number of items before you can straighten those bullets, and after you do get them straight, you may find the gain in accuracy not more than 2 or 3 percent. M. H. Walker.

Letters

(Continued from Page Three)

HP Gas Check which I did not particularly like because of the difficulty in moulding them. Lately I bought one of Jim Harvey's 38 Prot-X-bore zinc base bullet moulds. It is superior in several

ways. First, it moulds like a dream and most of the bullets are perfect. Second, I don't have to worry about metal proportions. And third, I don't have to re-size and lubricate. While I do not know about the accuracy yet, I am sold on these features. After trying the 38, I bought a 44 for the Specials. Therefore I was very interested in the article by Mason Williams on "Swaged Handgun Bullets." I think that anyone who reloads as I do would like the zinc base cast bullet, although the swaged one is superior. It is a matter of how much you want to pay.

Because I am not a good pistol shot and therefore can not tell if my loads are good or not, I had a Model 44 Stevens .25-20SS rebored by Ackley for the 38 Special. On it I mounted a B6 Weaver scope that I received with a Remington M722 I bought to make into a Free Rifle. This worked very well and gave me some startling results with my loads till I broke the mended extractor. I have sent for one of the \$9.99 Martins which I may have recut for the 44 Special unless I decide to use an old Stevens Model 44½ I have. I recommend making up a rifle for testing handgun ammunition as they are a lot of fun.

The second article I wish to comment on is the one by Alfred K. Friedrich. I thought the articles in the American Rifleman by Col. E. H. Harrison were timely and excellent. They answered a lot of questions that I wanted to know. I thought Mr. Friedrich was a little hard on him in his criticism, although I did appreciate his thoughts on lead bullets.

Yours truly,
Charles S. Craig
New York

(Editor's note: Mr. Friedrich has sent us some targets, fired the first week in May, to further support his contention that the .30 cal. Squibb cast bullet will give excellent accuracy with authoritative loads of powder. Two 10-shot groups fired at 100 yards, prone, with load of 22 grains of 4227 powder, measure 1.185 and 1.625 inch, center to center of widest shots. And two 10-shot groups with load of 25 grains of 4198 powder, same range and shooting conditions, measured 1.365 and 1.565 inch. Mr. Friedrich has been shooting rifles longer than a lot of us have and grew up on a cast lead alloy bullet diet.)

Dear Sir:

Would like to thank you for your "How To Shoot A Rifle At The Bench." We have had some good shooting weather here lately, so have had a chance to do some bench shooting. I find from what you wrote about bench shooting I have already and will in the future improve my scores by some sound advice on the subject. Have been looking for your next follow-up on the more technical points.

I have now one .222 Rem. Douglas barreled 722 Rem. varmint rifle and a .243 Win. Douglas barrel 721 varmint weight in stainless steel.

Yours,
Sid Forland
Minnesota

Rifle and pistol scores, alone, are only comparative for any particular shooting tournament or match. Low scores fired under extremely difficult weather conditions may be more commendable than unusually high scores fired under ideal weather and match conditions.

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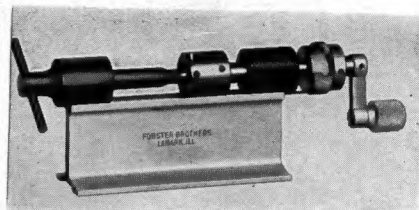
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| 218 Bee | 200 |
| 22 Hornet | 200 |
| 222 Remington | 200 |
| 25-20 Winchester | 200 |
| 32 Winchester Self-Loading | 200 |
| 32-20 Winchester | 200 |
| 35 Winchester Self-Loading | 200 |
| 351 Winchester Self-Loading | 200 |

LARGE PISTOL

| Cartridge | Primer No. |
|---------------------------|------------|
| 38-40 Winchester | 150 |
| 44 Smith & Wesson Russian | 150 |
| 44 Smith & Wesson Special | 150 |
| 44-40 Winchester | 150 |
| 45 Colt | 150 |
| 45 Automatic | 150 |

LARGE RIFLE

| Cartridge | Primer No. |
|------------------------|------------|
| 219 Zipper | 210 |
| 22 Savage | 210 |
| 220 Swift | 210 |
| 243 Winchester (6 m/m) | 210 |
| 25 Remington | 210 |
| 25-35 Winchester | 210 |
| 250 Savage | 210 |
| 257 Roberts | 210 |
| 270 Winchester | 210 |

| | |
|------------------------------------|-----|
| 7 m/m Mauser (7x57) | 210 |
| 30-30 Winchester | 210 |
| 30 Remington | 210 |
| 30-06 Springfield | 210 |
| 30-40 Krag | 210 |
| 300 H & H Magnum | 210 |
| 300 Savage | 210 |
| 303 Savage | 210 |
| 303 British | 210 |
| 308 Winchester | 210 |
| 32 Winchester Special | 210 |
| 8 m/m (7.9 m/m) Mauser | 210 |
| 8 m/m Lebel | 210 |
| 32 Remington | 210 |
| 32-40 Winchester | 210 |
| 33 Winchester | 210 |
| 8 m/m Mannlicher-Schoenauer (8x50) | 210 |
| 8 m/m Mauser (8x57; or 7.9) | 210 |
| 348 Winchester | 210 |
| 35 Remington | 210 |
| 358 Winchester (8.8 m/m) | 210 |
| 375 H & H Magnum | 210 |
| 355 Winchester | 210 |
| 401 Winchester Self-Loading | 210 |

| | |
|------------------|-----|
| 405 Winchester | 210 |
| 45-70 Government | 210 |

SMALL PISTOL

| Cartridge | Primer No. |
|----------------------------|------------|
| 25 Automatic | 100 |
| 25 (6.35 m/m) Auto. Pistol | 100 |
| 7.62 Mauser (7.63 m/m) | 100 |
| 30 Luger (7.65 m/m) | 100 |
| 32 Automatic | 100 |
| 32 Smith & Wesson | 100 |
| 32 Colt | 100 |
| 32 (7.65 m/m) Auto. Pistol | 100 |
| 357 Magnum | 100 |
| 9 m/m Luger (Parabellum) | 100 |
| 38 Smith & Wesson | 100 |
| 38 Special | 100 |
| 38 Special Super-X | 100 |
| 38 Special Super-Match | 100 |
| 38 Short Colt | 100 |
| 38 Long Colt | 100 |
| 38 Colt New Police | 100 |
| 38 Automatic | 100 |
| 380 Automatic | 100 |
| 41 Long Colt | 100 |

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3. 300 Meter Aggregate score, Du Bois, Pa., 1957, Don Robbins.
4. First and Second places, 300 meters, Du Bois, Pa., 1957, Clair Taylor and Don Robbins.
5. National Match Course, Du Bois, Pa., 1957, 1st, 3rd, 6th, 7th places.
6. National Match 10-shot 100 yd. aggregate, Augusta, O. Al Creighton, .3105".
7. National Bench Rest Championship, Johnstown, New York, 1955, Sam Clark, Jr.
8. 10 Shot 200 yard WORLD RECORD, Du Bois, Pa., 1954, Sam Clark, Jr. Score, or Group, .5276"
9. 10 Shot 200 yard WORLD RECORD, Du Bois, Pa., 1956, H. L. Culver (Present record) Group size .4016"
10. 1000 Yard, Famous Wimbledon match, any sight, 1955, Camp Perry, O. Frank Conway.
11. 1000 Yard, Famous Wimbledon match, any sight, 1956, Camp Perry, O. Frank Conway.*
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